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VOL. IV. JANUARY 1, 1895. NO. 1.

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# DENTAL DEPARTMENT

OF THE

# UNIVERSITY of MICHIGAN.

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## TWENTIETH ANNUAL SESSION

**BEGINS OCTOBER 1, 1895.**

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JONATHAN TAFT, M. D., D.D. S., DEAN.
N. S. HOFF, D.D. S., SEC'Y.

# THE DENTAL JOURNAL.

Published Under the Auspices of the Dental Society of the University of Michigan.

VOL. IV. JANUARY 1, 1895. NO. 1

## HYPNOTISM.

BY G. H. MEAD, A. B.,
ASSISTANT PROFESSOR OF PHILOSOPHY OF THE CHICAGO UNIVERSITY.

THERE is nothing new under the sun. In Herodotus, in Pliny and in Seneca we read of cures and prophesies which take place in the so-called temple of sleep. These were brought about in the Temple of Isis in Memphis, of Serapis in Canopus, of Alexandria in Thebes, of Apollo in Delphi and especially in the Temple of Aesculapius in Epidaurus. This sleeping was preceded by solemn vows, by sacrifices, by purification baths and by the use of the various salves, presumably of some narcotic character, by the drinking of water at holy wells, the miracle-working springs at Pergamos and the springs at the Temple of Jupiter Ammon; by fasts and attentive fixing of the statues of the gods and of the memorial tablets of the sick who had been healed; by the solemn marching in the sacred groves and processions into the temple with the singing of hymns, by examinations as to whether the sick were properly prepared. Finally it ended in the sleep, either in special dormitories or in the temples themselves on magnificent beds of furs, where all the lights in the temple suddenly were put out, upon which followed the dreams of the means of the cure, also accompanied by the touching and rubbing of the diseased limbs. This occurred among the Greeks; we find similar customs among the Druids, who for the sake of cure slept under trees, especially under oaks. Passing to the Middle Ages we find again in the Magia Naturalis, published in 1577, the following account: I had a friend who attained such influence over an acquaintance that whenever my friend wished, he believed himself to be changed into a bird or some other animal and carried out all manner of nonsense when he had taken a certain drug (presumably narcotic). He believed himself changed into a fish and swam with outspread arms upon the floor dipping now and then under the water. Another believed himself to be transformed into a goose. Another man, after taking the drug would fling himself upon the earth and move his arms and legs as one who is drowning. As the force of the drug gradually ceased, he seemed to rise up and then wring out, like a ship-wrecked man, his hair and clothes, and at last after his danger and labor, draw a deep breath. This and much more one who is acquainted with magic can do.

If again we go back to the cloisters of the Brahmins and of the Christians we find a constant use of suggestion under the guise of various rituals and sometimes with the use of narcotic drugs to bring about those states of religious ecstasy which characterizes the life of the Middle Ages. We find martyrs in the midst of the most severe tortures free from all sense of pain; religious devotees so sunk in their devotions and introspection that they lose all sensibility to outward stimuli, falling into what we should now call hypnotic trances. But often outside the cloister and the religious ceremonial we find constant evidence of cure of the sick by means of suggestion. The King's Evil in England is but one instance of many that might be cited. Thousands of epileptics yearly were brought to be touched by the hand of the divinely appointed king, and many went away cured of their disease. In the various miracle cures that are reported to us from contact with the holy relics, from the hands of holy men, we find everywhere the evidence of cure by means of suggestion. In all these cases the primary necessary condition was absolute belief, that is complete subjection to the suggestion of cure by contact with the relic or the hand of the holy man. As the hypnotic doctor at the present time first of all must arouse in his patient, either before the pypnosis or during the hypnosis absolute belief that he will be cured, so in these earlier days the necessity of faith was insisted upon. Here, as in the hypnosis in the hands of the modern physician, attention must be fixed absolutely upon the single idea—all other ideas must be shut out. For this purpose we find the most numerous means used to aid the attention. The solemn ceremonial accompanied frequently by the most startling phenomena to gain complete control of the attention were used for different cures. In the mysteries of ancient Greece, for instance that of Eluesis, we find that the initiated stood in a great body in the absolute darkness of night before the temple until suddenly there burst upon their eyes a brilliant light from the temple. Before this they were prepared by sounds, resembling thunder and such other imposing ceremonies as lay within the power of the priests, and under the influence of the sympathy of a large body acting upon each one, they passed over into an hypnotic trance.

The accounts that come to us of the cures by magicians from the earliest times on, show that the same paraphernalia is used. In various ways the attention of the individual is gained. He is led to give up his entire consciousness to the control of the magician; after this it becomes possible to work many of the wonderful cures which have come down to us and which in the light of the cures which the hypnotist can work in our own day no longer seem impossible. The modern hypnotist often is able to reduce refractory patients whom, by the ordinary methods he has not been able to hypnotize, by simply having them present when others are hypnotized. So we find in some of the hypnotic clinics in Paris and in Belgium that a large number are present and the influence of the one upon the other enables the physician to easily carry them over one by one into the hypnotic sleep. In the Middle Ages the evidence of the complete control of the mass of individuals by a single idea, often in the most absurd and romantic undertakings, passing over frequently into that which can hardly be separated from insanity. The mad dancing in Italy and the Children's Crusade are two instances of such phenomena. If we come down to the conditions of every day life, we find ourselves using suggestion in dealing with others, and ourselves subject to it in the most common circumstances. The child who has bruised his finger, or fallen and bumped his head is assured with a stroke of the hand or a kiss upon the injured finger that the pain is gone. The patient under the hands of the dentist who is assured that the operation will not be painful, who has his attention diverted from the pain, is often able to undergo an operation which under ordinary circumstances would be highly painful or even impossible for him to endure. In the realm of medicine we have only to remember the remark of the celebrated German physician, "It is not the medicine but the physician who gives it that cures." Many remedies which have won great repute when first introduced have very soon lost their reputation and become quite forgotten and we are led to the conclusion that the enthusiasm which followed their first appearance, and the belief that they first inspired, was the cause of the remarkable cures which are recorded of them, and when the conditions which heralded their first appearance passed away they themselves became worthless.

Every physician has in his practice cured or helped many patients by the use of medicines which he knew were in themselves perfectly valueless, but about which gathered the belief of the patient, which in other words acted as a suggestion upon which the cure followed. Electricity, massage, Swedish movements, often serve their greatest purpose in fixing the belief of the patient in his own recovery and we owe their effect to the constant influence which their continued practice brings with it. Many a physician who perhaps knows nothing of hypnotism and believes himself to be far enough from the use of it, in dealing with nervous patients, with hypochondriacs and with hysterical patients, by simply arousing the belief in the cure by ordering them to be well has produced wonderful results. While, upon the other hand, the whole class of quacks depend upon their advertisements and often absurd ceremonials that accompany their treatment for cures that they effect almost entirely through suggestion. How impossible it is often in the midst of our boasted enlightenment to suppress this method of treatment in its absurd and unscientific forms we may see in mind cures and the Christian scientist of to-day. Whether we recognize the suggestion as a legitimate means of practice or not, we have absolute evidence that it not only has always been used since the beginning of history, and indeed far back of this, but also that it will continue to be used, if not by the scientific, by the quack and the crank. It is impossible not to draw from this the conclusion that there is a class of the diseased who may be treated successfully by the hypnotist, and the present movement which has introduced against the will almost of the scientific classes hypnotism among the weapons of the physician, is but an effort to master this means of treatment which has been used outside the scientific circles from time immemorial.

In 1530 Paracelsus called attention to the influence of the heavenly bodies and also of magnetic substances upon the physical system and laid the foundation of the doctrine of magnetism. Soon after him Goclenius and Helmont used so-caled magnetic salves for therapeutical purposes and Robert Flud and Maxwell in Scotland pursued similar treatment. But the real founder of the modern movement was Freidrich Anton Mesmer. He attracted attention by his dissertation on the influence of the planets on the human body, and soon turned his attention to the influence of mineral magnetism. Mesmer, however, found that this magnetism could be transferred from mineral substances to water and even to animals and men and propounded the doctrine of animal magnetism. In 1775 he published his so-called discovery in a circular letter to various academies, but found little support. Leaving Vienna on account of his enemies, he went to Paris in 1778 and won recognition there and founded a magnetic school. In 1784 a commission of the government investigated the so-called animal magnetism, denied its existence and forbade the treatment. However, Mesmer won numerous supporters and disciples who added new elements to his doctrine. One of the most important, Marquis de Puységur, discovered the state of somnambulism. In 1787 a French doctor Petétin discovered catalepsy and the so-called transposition of the sensation.

Mesmer's method involved many elements which have quite disappeared from the modern hypnotic treatment, especially that of the magnetism itself. He used to gather his patients about a bath in which there was so-called magnetic water and out of which there ran steel rods upon which the patients laid their hands and by means of which he was able to bring a large number of persons within the magnetic circle. Music was constantly played in the same room and Mesmer entered with his commanding person clad in quite the paraphernalia of the magician; he stroked the patients and as one after another would fall into the trance would personally attend them. It was from these trances that the patients were healed, and the influence was supposed to pass from the magnetiser himself or from the magnetised object to the patient. But early in the century 1814 Abbe Faria, in Paris, expressed the conviction that there was no magnetic fluid, but that all these effects are to be brought back to the will of the patient. Faria therefore announced the position which was later established, that hypnotism depends upon suggestion.

. The next important name in the development of this branch of therapeutics is the physician James Braid, of London. He was interested by the exhibitions given by a magnetiser, La Fontaine. He made independent experiments in 1840 and found that by fixing some glittering point one would pass over into a somnambulic state. This condition would answer to the modern auto-hypnosis. Braid used this condition as an anæsthetic in surgical operations. He was acquainted also with the condition of catalepsy and with many of the effects of suggestion. But the animal magnetism maintained itself side by side with Braidism, as his method of treatment was called. It was not until Liebeault, a physician in Nancy, turned his attention to these phenomena that the true nature of this sleep was established. What Faria had already maintained Liebeault proved in true scientific fashion, that there exists on the side of the hypnotiser, suggestion, a psychical influence, and upon the other the belief that results from this, that is, the reception of the suggestion, that verbal suggestion was sufficient for producing artificial sleep. But Liebeault's statements won little recognition until his disciple Bernheim published his work upon suggestion and its curative power in 1866. His treatment of the subject was more thorough going than Liebeault's and his position was supported by numerous experiments carried out in his own clinic. His book remains at the present time the most important work upon hypnotism, especially in its practical application.

Charcot, the celebrated neuropathologist in Paris, maintains a peculiar position with reference to hypnotism, identifying it largely with hysteria, assuming that only the hysterical are susceptible to hypnotism, and that in general hypnosis must be regarded as a neurosis. He has described three phases of hypnotism, lethargy, catalepsy and somnambulism. But as most of the modern investigators have been unable to identify these three stages the assumption is justified that they exist n Charcot's hospital as result of an unconscious training of the patients, or in other words, suggestion.

[Delboeuf, in Luettich, has accomplished important results in this field, and in Amsterdam, van Eeden and van Renterghem in all their modelly constructed clinics for psycho-therapeutics. Vetterstrand, in Stockholm, has also accomplished astonishing results with hypnotic therapeutics, and Professor Forel, Director of the Asylum for the Insane, at Zürich. The extended work of Professor Forel is worthy of especial attention on account of its psychological treatment of the problem. In England Drs. Charles Lloyd, Tuckey, and Hack Tuke have given especial attention to hypnotism. In Germany, since 1880, Heidenhain and Berger, in Breslau, Weinhold, in Chemnitz, Preyer and Eulenburg, in Berlin, have treated the subject especially theoretically. Under the influence of the Nancy School Albert Moll, in Berlin, and Max Dessoir and Grossmann have devoted themselves peculiarly to hypnotism. Moll's work, of which there is an excellent English translation, is next to Bernhein's, the next in importance, and commands the highest respect even of those who are accounted opponents of the therapeutic use of hypnotism. Grossmann edits a Journal of Hypnotism, and the celebrated physiologist, Preyer, has done great service to the cause by his lectures upon hypnotism at Berlin University.]

Hypnotism presents itself as a physiological and psychological problem. The peculiar states of somnolence and somnambulism and catalepsy call for a physiological statement and the psychical conditions of those who are under the influence of hypnosis are the strangest that come under the observations of the psychologist outside the asylum of the insane. Indeed, great hopes have been built upon hypnotism as presenting a field for psychological experiment. The absolute pliability of the mind under the influence of this state seems to make it possible to bring it within the scope of the scientific investigator. Here it was thought one could determine his own condition and by varying these build up an inductive science of psychology. But hypnotism has not proved what these venturous psychologists had hoped. Beyond varying theories of double and multiple consciousness hypnotism had added little to the doctrine of the psychologist, and not only has he been unable to reap new fruit in this field, but it remains to the present day one that has not been but little psychologically explored. On the physiological side there has been almost as little accomplished, except the description of the hypnotic conditions and supposed changes in the rythm of the circulation and breathing and assumed variations in the vaso motor rhythm; almost nothing has been determined of the physiology of the hypnotic condition. That there must be extensive physiological changes in the central system there can be no doubt. The anæsthesia which accompanies the hypnotic state almost invariably, the constant presence of positive and negative hallucinations in the fields of all the sense organs, not to speak of the peculiar cataleptic conditions that frequently accompany the hypnotic state must represent changes of no slight character in the brain and spinal column. [Hypnosis is divided into two phases which differ from each presumably only in degree. The first condition is that of somnolence, the second condition that of somnambulism. This modest number of stages is the one which answers best to modern theory and practice, though different physicians who use the treatment give varying numbers—from two to nine.] We will attempt first to give a simple psychological statement.

Both somnolence and somnambulism, the two stages in hypnotism, result from the suggestion of sleep. The condition of sleep is therefore not essential to hypnotism. The fundamental fact is suggestion. That sleep is almost invariably induced is due to the higher degree of suggestability which comes with it. The therapeutic effects that flow from hypnotism depend not upon the sleep but from the suggestions during sleep. [This is of peculiar importance, especially in understanding the use of suggestion in slight operations, such as fall especially to the dentist on the practical side and in connecting it with our theory of psychology on the theoretical]. Hypnotic sleep, therefore a phenomenon of suggestion; suggestion is not a phenomenon of hypnotism. The treatment is therefore one that commences with the suggestion given by the physician and is frequently used without the suggestion of sleep. In this form most dentists are familiar with it. The advice given so frequently, and often with so good effect that one should fasten his thought upon something else during the operation or that one should insist that there is no pain is as really treatment by suggestion as that given in the deepest somnambulism. The cause is therefore the suggestion coming without, but the patient must present a peculiar psychical condition that the suggestion may be effective. It is necessary that he should turn his attention away from all other things except that upon which he concentrates it. But this attention is generally different from that which characterizes our every-day activities, and it is with this peculiar character of attention that we enter into the definite field of hypnotism. The suggestion itself is a perfectly normal stimulus and our immediate reaction upon that stimulus is also normal. If a friend suddenly calls our attention to an object, giving it some definite name, we recognize a perfectly distinct tendency to see the object that he has spoken of. It is not only Polonius, the courtier, who can see now the camel, and now the whale in the formless clouds at the suggestion of another. If a stranger suddenly meeting us suddenly gives the most strange of directions, the most unwarranted of orders we recognize an immediate tendency to carry out these directions and orders, however instantaneous may be our resentment of the insult and complete the refusal to fulfill them. The tendency, therefore, to execute a suggestion is a normal tendency. It is not then in this tendency that we can seek for the peculiar and abnormal character of hypnotism. Not only are the words and directions of others suggestions that tend to accomplish themselves but also there is no object that comes within our field of consciousness that does not produce a tendency to some reaction if the objects have any meaning for us at all. The peculiarity of our normal attention is that we are able to coördinate all these tendencies so as to bring about rational conduct. If my attention is given to reaching some distant object, I must overcome the tendencies which every by-street and every gate, which every opening offers to me to turn aside from my path. But for this attention the gates and streets are not outside of consciousness. They form a subordinate part of the surrounding world within which and by means of which I accomplish what I have to do. Every object that comes to my hand, that falls within my field of vision, tends to call forth activities that must be subordinated to higher ones if my conduct is to be rational and life itself possible. It is necessary to lay especial stress upon this character of normal attention if we are to understand the abnormal attention which characterizes hypnotism.

[Concluded in the March Number].

# BRIDGE-WORK.*

A. W. HAIDLE, D. D. S.

In what cases is bridge work advisable, and how should the piece be constructed? These questions are of vital importance to the dentist of to-day.

In these closing years of the nineteenth century, when our many colleges are sending out such hords of young men, nearly all of them fully qualified for performing this class of operation, even the most causal observer must have noticed that it is being used indiscriminately.

The public has become so well informed on this subject that when the patient presents himself with a number of teeth missing, the usual question is put to the dentist, "May I have a bridge put in there?" What follows? The patient is in most cases dismissed in a happy frame of mind, with a piece of bridge work in his mouth, and, minus several dollars. Why do we find this condition of affairs; this universal cry for bridge-work? Why this servile catering to the demands of the public on the part of the dentist? Is it a healthful condition, and if not how can we best improve it?

In answer to the first question, as to why there is a great demand for bridge-work, I should say that the demand is a result chiefly of alluring notices in the newspapers, and signs on the windows of some of our practitioners. It is also the result of a feeling of repugnance toward wearing a plate, and a desire for something less cumbersome and more cleanly. This feeling and desire coming quite naturally to those who have already worn a plate, and to others because of a better education among the general public in matters pertaining to the care of teeth.

To the second question I should make answer by saying, that dentists accede to the demands of their patients, whether the demands be consistent or otherwise, for several reasons.

Enumerated, they may be stated as follows: First, the dentist has before him the prospect of a larger fee for the insertion of bridgework than for an ordinary piece of vulcanite; secondly, if his patient demands bridgework, he dares not refuse the demand for fear of incurring the displeasure of the patient, and for fear of losing both the work and the patient; lastly, there is often a desire on the part of the dentist (but mind, I do not say it is not a laudable desire,) to display his skill, an ambition to furnish his patients with a higher grade of work, and to be acknowledged as an expert in this particular branch of dentistry.

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*Read before the DETROIT DENTAL SOCIETY, NOV. 12, 1894.

Is this a healthful condition, and if not how can we best improve it?

I should say that it is not a healthful condition. Many bridges are inserted where the conditions plainly indicate a plate; many are improperly constructed; many do not have a sufficiently secure anchorage, and some are not cleanly. We can improve this unhealthy condition by following the dictates of common sense. Let us be more conservative. Let us be certain that a bridge will be the best thing to insert in each particular case, before inserting it. What conditions indicate the insertion of a bridge, and how should the piece be made? Where one, two or three teeth are missing among the molars and bicuspids, and where the anchorage is secure, one may be put in, provided sound teeth are not injured or endangered. If the four incisors have been lost, or any one or two or three of them, a good piece may be made under favorable conditions. Five or six teeth may be attached, where there are more than two anchorages, though so extensive a piece of work is rarely advisable. Various other conditions might be mentioned, but it is unnecessary.

A number of points, however, are to be observed in the construction of a bridge. Always have sufficient and secure anchorage. The attachment of the piece to the anchorage should be strong and durable. Never hesitate, if a portion of a sound tooth is to be sacrificed, to sacrifice the whole tooth by cutting away sufficient tooth substance to permit covering of the entire tooth, especially if it be a second bicuspid or one of the molars. In such cases it is better to do this and so protect the tooth from future decay, than to leave it partially exposed by using a band attachment, to the then new and favorable conditions for decay.

Where a band attachment is to be made use of, it is better to make the band at once broad and strong, for with a weak and narrow band the patient will be sure to return, and much worry to the operation will result.

Always protect the grinding surfaces of the molars and bicuspids, and the cutting edges of the cuspids and incisors with at least one thickness of gold. Never insert a bridge which will prevent the thorough cleansing of the piece itself, and of the surrounding and underlying parts. In conclusion, unless a bridge is decidedly indicated I should always advise a plate, and advise one having a metallic base, for if the patient can financially afford bridgework he can equally well afford a plate with one of the noble metals as a base; a gold plate, or one of continuous gum.

# INDIA RUBBER.

J. W. MINER, '97.

In treating this subject I do not wish to assume the rôle of instructor to my Juniors and Seniors, for, considering my youth, (being a Freshman) they have the advantage of me by one and two years respectively.

Neither do I wish to lead my associates of the class of '97; but with the simple aim in view to portray some of the interesting features of india rubber, and the uses to which it is applied.

India rubber, or caoutchouc, obtains its name from cachuchu, of the South American Indians. It is a peculiar substance, composed of carbon and hydrogen formed in suspension in the milky juice of a great many different kind of plants. At one time it was supposed that all milky vegetable juices contained it, but this is not the case. Many of these juices yield gum free from caoutchouc.

Another substance which, in some particulars, resembles india rubber, is gutta percha, although it differs very materially in being non-elastic, or elastic in a very small degree. Notwithstanding this very striking characteristic, the two are often confounded in the public mind, probably on account of the similarity of their application.

Gutta percha is turned by the physician to various uses. Splints are made by cutting strips from the rigid sheet; and by soaking in hot water for a short time they become pliable, and when bandaged to the limb and allowed to dry they retain the shape of the injured part to which they were attached. The cloth of gutta percha is sometimes used in the place of oiled silk, but is not very durable, and is less flexible. It is readily dissolved in chloroform; and in such solution is used for covering large, raw surfaces, as when the chloroform evaporates it leaves a pellicle of solid gutta percha.

Although india rubber was known to the Chinese and Peruvians at an early date, it was not until the beginning of the Eighteenth century that importations were made to Europe. The first scientific notice of it appeared in the writings of M de la Condamine, who makes mention of it under the name of cachuchu, in 1735. He described it as being in constant use by the natives, in the form of bottles, boots, balls, etc. They also used it for cloth—water proof.

A number of scientific papers were prepared by eminent French chemists during the years intervening from 1735 to 1770, treating on its solubility and chemical properties, At the latter date Priestly mentioned the gum as being used for erasing lead-pencil marks, its cost being three shillings for a cubical piece of about half an inch.

Important contributions to the chemistry of caoutchouc have also been made by Faraday, Andriana and others, while the practical applications have been made by Mackintosh, Goodyear, Day and other inventors. In 1826 Rattier and Guibal invented machinery for cutting threads of rubber for the elastic fabrics which have since been extensively used.

The most important invention in regard to rubber was made by Charles Goodyear, of Massachusetts, in 1839, and patented June 15, 1844. It consisted of mixing a small quantity of sulphur with the rubber and then fashioning articles from the plastic material and curing or vulcanizing the mixture by exposing it to a temperature of 265° to 270° F. This product, known as vulcanized rubber, soon found a thousand and one important applications.

To E. G. Day should be given the credit of inventing the hard rubber which is so extensively used in the manufacture of buttons, combs, jewelry, rules, etc. Day's patent was for the mixture of sulphur in a larger proportion, two of rubber to one of sulphur, and heated to a temperature of 275° to 300° F. His patent was issued August 10, 1858.

Notwithstanding the fact that trees yielding caoutchouc are found in a large belt of territory around the globe, including, at least, 500 miles on each side of the equator, the demand for the best qualities is in excess of the supply.

The principle forms of rubber imported may be grouped under four heads, the order in which they are here given indicating their respective values: South American, Central American, African, Asiatic.

The varieties which are almost exclusively used when great elasticity and durability are required, are the Para, Corea, and Madagascar rubbers. The Para rubber is obtained from a large tree, upwards of sixty feet in height, branching from the base, having trifoliate leaves, the leaflets being lanceolate and tapering at both ends. Other varieties belonging to this family grow abundantly in the moist valleys of the Amazon and its tributaries. Where the temperature ranges from 90° to 75° at noon, and never lower than 70° at night, while rain is rarely absent for a longer period than ten days, seem to afford the necessary requirements for its propagation.

Some of the trees attain an enormous growth, especially those of India, where they grow solitary, or in two-fold or three-fold groups. The main trunk of one, according to statistics, measured 74 feet in circumference, while the girth, including the supports immediately around it, was 120 feet. The area covered by its expanded branches, was 600 square feet.

The trees are found in great abundance in the district of Chardwar, in Assam. It has been reported that there are about 35,000 of these mammoth trees growing on a territory 30 miles in length by 8 miles in breadth.

There is another variety of the tree,—or vine, as it is described as a creeper,—that is so rapid in its growth that in five years it extends 500 feet, or more, and has a girth of 20 to 30 inches. This tree yields, from tapping, without seeming injury, from 50 to 60 pounds of caoutchouc in one season.

The rubber from Assam is exported from Calcutta. It has a fine, glossy appearance, and a bright pink color. The quality of this rubber, though fairly elastic, is much depreciated in value on account of its adulteration and the careless mode of its collection.

The principal sources of its supply, and the best qualities, are from South and Central America, and Mexico.

The juice is collected by different methods by different peoples. It is done in the dry season between August and February, by tapping the trees in the evening and gathering the liquid the following morning. The tapping is accomplished by making a deep incision horizontally near the base, and then from this a number of others in a vertical or oblique direction, extending up the trunk. The juice, as it comes from the tree, very much resembles ordinary cow's milk, in both color and consistency. It is usually allowed to collect in small cups made from the clay soil, or in dishes made from leaves.

This juice, when evaporated, yields about forty per cent. of rubber. From each tree is obtained about two ounces a day. It has a strong odor of ammonia, which it contains in a small quantity. This is rapidly given off when exposed to the air, and as a consequence the liquid will not keep any length of time unchanged.

After being evaporated to a little less than one-half its original bulk, it is carefully dried. This is done by repeatedly dipping a paddle into the liquid, or by spreading a thin coat evenly over a mold, and then holding, or turning the mass of rubber thus formed, in the smoke or vapors obtained by burning or heating certain oily palm nuts.

In preparing the pure caoutchouc for the manufacturers, the natural juice is mixed with five or six times its bulk of water. Then it is either heated, or a quantity of common salt or hydrochloric acid is added, when the pure rubber separates as a white opaque substance, which becomss transparent when dry.

Some of the properties, both physical and chemical, may be of interest to the class of '97, as they are now daily wrestling with the "ates" and "ides" of the some sixty odd elements which they are expected to master. Perhaps an advance lesson may not be amiss, and at the same time be useful.

India rubber, as has been previously mentioned, is composed of carbon and hydrogen, in the proportions of 87.5 per cent. of the former, and 12.5 per cent. of the latter.

The action of cold and heat present many points worthy of notice. When exposed to a temperature approaching 0°C., it gradually loses its softness and elasticity, and finally becomes rigid and inelastic; but it may be restored to its normal condition by submitting it to a temperature of 35° to 40°C. If the heat is raised to 100° to 120°C., it becomes considerably softened, and loses its elasticity, but resumes its former condition by being cooled. At 150° it becomes viscous, and melts at 200°. If raised to higher temperatures, a variety of gases is given off. It is soluble in but few liquids, such as benzol, ether carbon disulphide, chloroform and a few others. The last two named are the more powerful solvent agents. Dilute acids and alkalies have little or no effect on this element; but strong sulphuric acid chars it, and concentrated nitric acid rapidly oxidizes and destroys it.

The moderate action of either chlorine, bromine, or iodine, hardens or vulcanizes it; but if allowed to act freely, they completely destroy it.

Fatty matters exercise a remarkably destructive action upon rubber, causing it at first to become soft, and afterward hard and brittle.

The crude material as it is put upon the market, contains many impurities, ranging from fragments of wood and bark, to stones or large lumps of clay; and sometimes hay or a similar substance is introduced to make the specific gravity about equal to the genuine article. The impurities are removed by softening the gum by soaking, then slicing it up by hand, when the foreign substance may be removed. It is then masticated by being repeatedly passed between powerful rolls under water. The rolls have fluted or corrugated surfaces. By this grinding process it is torn into shreds and cleansed. Afterward, when dry, it is kneaded between smooth rolls till thoroughly mixed and reduced to a homogenous mass. At this point the necessary material to convert it into soft or hard vulcanized rubber may be added. The material used for this purpose is sulphur, or some compound of that material.

For the soft vulcanite about six per cent. of sulphur is used; then it is subjected to a temperature varying from 250° to 280° F. Hard vulcanized rubber is prepared by mixing with it about fifty per cent. of sulphur. The temperature in this case is necessarily higher, being 300° to 305°F. The time allotted for either kind is the same, about one hour.

The vulcanizing is done in a strong cast-iron cylinder, by the application of steam.

Rubber used in the manufactures is often colored by such pigments as vermillion, oxide of chromium, ultramaroon, antimony, lamp-black, or oxide of zinc.

Caoutchouc, has of late years acquired enormous importance, and is found in every department of industrial arts. It is used in an endless variety of ways,—in blocks, cakes, sheets; in tape or threads of woven fabrics; as a varnish between two surfaces of cloth, or on one surface, for water-proof; in solution as a cement; combined with sulphur and other substances, as soft vulcanized rubber, used for the manufacture of boots and shoes, steam and water-packing, fire hose, belting, etc.; combined with a larger proportion of sulphur, and subjected to a higher temperature, as hard vulcanized rubber, for the manufacture of pen and pencil holders, inkstands, jewelry, canes, syringes, etc.; in combination with asphalt, oils and sulphur, it is used for covering telegraph wires, being a valuable substitute for gutta percha, as it is not affected by atmospheric influences which so quickly destroy the latter substance; colored with vermillion it is used for mounting artificial teeth.

In the preparation of the rubber for the dentist's use, the ingredients entering into its compound are kept a profound secret by the manufacturer, and are revealed to his successor only when called to part with all things else that are earthy.

## THE RELATION OF CHEMISTRY TO DENTISTRY.

DESSIE B. ROBERTSON, '97.

JUST as in this external world of ours no one being lives to himself alone, but all are mutually dependent on each other; so in that hidden silent world made up of the delicate organisms composing our bodies no one organ is independent of the othe but each suffers by another's injury.

Therefore the dental student does not confine himself to a knowledge of that part alone with which he is to be especially concerned, but must understand thoroughly, not only the anatomy of the body, but also the histological structures of its every organ. He must go farther than this. He must acquaint himself with the materials which, atom by atom, build up this wonderful mechanism; for, aside from natural skill and a good anatomical knowledge, there is perhaps no qualification which is more conducive to his success, than a clear insight into the science of chemistry.

Not only is the oral cavity affected by the chemical condition of the other organs, but it is in itself a vast chemical laboratory. Here reactions are every moment taking place. Important work is constantly being done at varying temperatures on varying materials.

All this has a direct bearing on the dentist's work. If he be called upon to diagnose a disease of the mouth, he must be able to recognize not only what chemical combinations have brought about the result but also what elements are necessary to restore the involved parts to their normal condition. He must understand the properties of the fluids of the mouth, so that he may foresee the exact effects on the different metals he may introduce therein. In dealing with these metals he must know the laws which govern them, their affinity for each other and by what means it may be suspended, modified or increased; the agencies of light and heat and the part played by them in economy of the whole. Indeed, should we pause to consider how many of the smallest details of dental work involve chemical principles, we would begin to realize the importance of its being thoroughly understood. From the primitive plaster model of the beginner to the construction of the most intricate mechanical contrivance chemical reactions are always an important part of the process.

While it is true that a dentist may be a success in his profession without understanding any of these laws, using them day after day unconsciously, merely because he has been so taught, how much more successful will the same man be, possessed of a knowledge bringing these vast laws under his control.

The world's progress, from century to century, has been due only to the fact that man is constantly possessing himself to a greater extent of a knowledge of nature's laws and is benefiting himself by an application of them; so the intelligent dentist of to-day, if he desires to keep his profession in the line of advance must seize upon every opportunity of utilizing these laws, among which none are caculated to afford him greater advantages than the laws of chemistry.

## ACTION OF ARSENIOUS ACID ON TOOTH-PULPS.

Dr. W. D. Miller, of Berlin, records the following conclusions after a series of experiments: First.—The rapidity and intensity of the action of arsenious acid depends, under certain circumstances, to a very considerable degree upon the substance or substances with which it is incorporated. Second.—Where there is but a small point of exposure, and in particular where extensive calcification has taken place in the pulp, excharotics should be avoided, since the contraction of the tissue retards the absorbtion of the arsenic. This retardation is but slight where there is a broad surface of exposure. In stubborn cases where applications of the ordinary paste fail to effect the devitalization, a paste consisting of arsenious acid in oil of cloves, glycerine or salt solution should be employed, undiluted by any third constituent. Third.—Thymol is worthy of a trial as a substitute for morphia on account of its anesthetic and antiseptic properties. Fourth.—For devitalizing pulps of milk-teeth or remains of pulp-tissue in root-canals, arsenious acid, if employed at all, should be diluted by two to three parts of some other constituent, (thymol, oxide of zinc, morphia, iodoform). Dr. Miller further states that he has been making use of a paste having the following composition:

℞ Thymoli;
Acidi arsenicosi, āā x:
ol. caryoph., qs. ut ft. pasta.

—*Cosmos.*

## PROSTHETIC TECHNICS.

There has probably been no greater advancement made in any line of college instruction than in the study of techincs as a basis from which the student may acquire knowledge and manipulation in the practical departments of his work.

Various authors, notably Dr. G. V. Black, have greatly extended this line of study until it has reached a degree of perfection. Following closely this work of Dr. Black is a new book, "Prosthetic Technics," by Dr. T. E. Weeks, of Minneapolis, Minn. From the many editorial praises it has received in the various dental journals, the book, undoubtedly, is the most valuable one yet published.

# EDITOR'S TABLE.

We will only say the operating room is as dark this year as it was for the class of '94.

* * *

That class spirit is at low ebb is shown in the department classes, barring perhaps the Freshman class. Several meetings of the Seniors have been held and a cane, ring, watch-fob and pin considered, but no definite action taken. While there may have been enthusiasm in a certain way the spirit of the class was not strong enough to adopt any of the above as a memento of college life.

* * *

In the past history of the Journal it has been the custom for the Dental Society to elect editors to the Board, depending only upon the wish of the society. The popular man of the class, regardless of his journalistic ability, could then be elected. This year a new rule has been established. The editor from the Freshman class is now chosen by competition. The articles written by the competitors are thoroughly examined and, upon a vote, the choice of the Board is recommended to the society for confirmation. In leaving the position open to competition, a field of journalism is opened to all aspiring journalists. Mr. Miner will represent the Freshman class this year.

* * *

The post-graduate course as at present offered is one of the best, if not the best to be had in this country. Not many have availed themselves this year of entering upon the work, but as its results become known a large increase may be expected. For years the aim has been to increase the efficiency of this course. In former years a post-graduate course meant, in a great degree, the completion of one more year's work of the same nature as that already given. The course as now given embraces a review of the work of the three years and work of an advanced degree in the principal studies. The degree given is well worthy of the time spent to obtain it. That we might be both practical and theoretical men the course was changed.

THE JOURNAL does not wish to take upon itself the task of teaching better manners to some of the department, but it sees need of complaint. We will say nothing of the Freshman and Junior classes; if need be they have time for improvement. It is of the Senior class we wish to speak—not to the class as a whole but to a small number. At the beginning of the year the clinics for the operating room are small—and the operators having patients would not make a large majority of the class. It is then those not having patients, at the request of the doctors in charge, visit the various chairs that they may have an idea of the work. While standing at the chair they have made remarks unbecoming gentlemen, making it very embarrassing to patient and operator. A case of this kind came to our notice recently. Our clinics expect to be and should be treated fairly by all. If we expect to be gentlemen now is the time to cultivate gentlemanly conduct and politeness.

* * *

PROFESSOR MEAD'S article on "Hypnotism" is certainly an interesting one to the public and should be especially so to members of the dental profession. The field of hypnotism is not a narrow, but a wide and extended one and to set a limit to its use would be impossible. We often hear of results accomplished by hypnotism bordering on the miraculous. To the student of philosophy this is not strange—he has studied the effect of hypnotism; to the uneducated its results are wonderful. Its relation to dentistry as time advances will be watched closely by the dentist. Many have made use of it and have been successful, performing operations without the least pain to the patient. The other day we read not only of its use at the University of Minnesota, but of its complete success. Its study should not be limited to psychologists and scientists alone, but should be studied by the dentist that its full value may be appreciated by him in his work.

* * *

WHY not let the Juniors work in the operating room? This is a question we frequently hear. At the beginning of the year when there was a scarcity of patients, operators were correspondingly idle. It is not infrequent now to see clinics turned away for lack of operators. The class of '95 is smaller than that of '94 and several chairs in the operating room are vacant, which could be utilized by the Juniors. A number have signified their willingness to purchase their Senior outfit, if they could at odd times work in the operating room. They would then become acquainted with the instruments needed in their Senior year, and not be as ignorant of their use as we are afraid some usually are at the opening of the college year. A majority of the class leave for their summer vacation wishing to work in a dental office, but having had no experience with the dental engine or operating instruments their usefulness is limited to prosthetic work alone. We but speak the truth when we say a large number of the Junior class would willingly work in the operating room were the chance given them.

* * *

THERE is a tendency on the part of a great many physicians to recognize the professional dentist as being the proper individual to extract teeth, perform surgical operations of the oval cavity and to administer medicines which pertain to such parts. This recognition is partially due to an increasing tendency in the medical profession to specialize in some part of the human body; and in proportion as this specialization increases, dentistry will assume its place among the medical specialties, and be recognized universally as such. The dental colleges and societies throughout the country are materially assisting in elevating the profession above its present standard by their continuous agitation in the demands for higher requirements, and consequently better men enter the profession of dentistry. No college in the United States is making more strenuous efforts to bring dentistry out of the "mechanical art" rut and elevating it to a professional basis, than is the University of Michigan. This is evident by the increasing requirements for admission, and adding to and extending the course each year.

* * *

IT IS a noticeable fact that too many articles written by members of the profession upon important subjects show a lack of diction in the use of words to express accurately anatomical locations and structure. There is no excuse why a writer or speaker should not use *cuspid* for canine, *inferior maxillary* for lower jaw, and that carious cavities be designated by the names of the surfaces of the teeth in which they occur; such as *labial* for the incisors and cuspids; *buccal* for the bicuspids and molars; using the word *lingual* for all of the teeth, discarding the word *palatal* "*occlusal*" for bicuspids and molars and *incisal* for the cutting edge of the incisors and cuspids, etc., *ad infinitum*. One of the greatest difficulties which confronted the World's Columbian Dental Congress was the formulation of a universal system of nomenclature that would be acceptable to the profession of the world. This difficulty was greatly due to the fact that dentistry is a rapidly developing science, and the nomenclature is in a degree adjusted to the modes of expression of the individual writer, which are often good in themselves, yet stand as a stumbling block to the adoption of a definite system for general use. The necessity for greater uniformity in the use of dental terms is becoming more apparent to those who are advanced in the profession. It is desired and hoped that within a few years these mature minds will mold into a more permanent form a nomenclature that will be regular, concise and homogenous, so that writers and speakers may be able to present their thoughts with accuracy and be readily understood by readers and hearers.

## CORRESPONDENCE.

IN the "Notes" of the May number of last year's JOURNAL appeared the following:

"We are in receipt of a program of the Students' Society of the Dental Hospital of London, and their published proceedings, by kindness of Mr. Cassidy, '94. The subjects are scientific, though mostly presented by professors and members of the profession. It is interesting and disgusting to notice how they guard the use of their degrees, and ignore those granted in this country."

We take pleasure in publishing a letter received some weeks ago regarding this item.

33 BRIXTON ROAD, S. W., 8-10, '94.

DEAR SIR.—The May number of your Journal having been placed before our notice by an unknown gentleman residing in America, we find in it some very mistaken ideas as regards ourselves which I beg to correct.

On page 90 you say, "The subjects are scientific, though mostly presented by professors and members of the profession."

Let me say that all the gentlemen reading papers before our society are students now studying in our hospital and as yet unqualified. Mr. Nicol certainly has a medical and surgical degree, but had not at that time taken his dental diploma.

Your article continues: "It is interesting and disgusting to notice how they guard the use of their degrees and ignore those granted by this country."

What, please, is your reason for this statement? I fail to find any, unless it be that on the back of our card we make no mention of Mr. Nathcroft's American degree, and with regard to him would ask you to note:

1st. That his name occurs in a list with others, holding our L. D. S., and that with the exception of the secretary, none have their title affixed.

2d. That Mr. Nathcroft has the L. D. S. as well, which is omitted.

3d. That strangely enough Mr. Nathcroft does not seem very proud of his American degree, for he does not record it himself in the Medical Directory, nor call himself "Doctor," but rather suppresses all mention of it, apparently preferring his L. D. S.

We, of course, do not wish to say that we disagree with the action of the Medical Council, who have, I believe, given you ample reason for their late action.

I remain, yours truly,

D. P. Gabell,

Hon. Sec. Students' Society of the Dental Hospital of London.

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H. F. Hussey, Editor-in-chief of the Journal for last year, replies as follows:

It seems that the May number of the Journal made some misstatements regarding the "Students' Society of the Dental Hospital of London." At least it has incurred the sore displeasure of Mr. D. P. Gabell. In his correction of the notice, he says all the gentlemen named are students, and "as yet unqualified." We admit that *students* would, as a rule be *unqualified* to treat knowingly some such subjects mentioned, as "Comparative Development," and "The Diagnosis and Treatment of a few Exceptional Cases one Meets with." Hence we accept the correction. As to the remark about "how they guard the use of their degree," the gentleman furnishes us further evidence in his letter, of the truth of the statement, when he writes: "We of course do not wish to say that we disagree with the action of the Medical Council, who have, I believe, given you ample reason for their late action." So that point admits of no controversy. The English spirit of the profession must be very evident on that side of the water. for it is no secret here so we are not surprised that *one* gentleman who has a degree from Ann Arbor, and also the L. D. S. degree, should give more prominence to the latter. It simply shows American sagacity, for he must realize that it is a case "When in Rome." We have no desire to pick a quarrel with our English cousins, but shall be quite willing to measure professional swords with them at any time, regardless of their recent "Embargo Act." We preceded them by a century on such a thing, the effect of which has been more far-reaching than anything liable to be inflicted on us by John Bull.

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AN apology is due the subscribers of the JOURNAL for the way in which the July number of last year was printed, and a better understanding may be due the board of editors of last year. The papers, constituting the principal matter for publication, were sent to the printer soon after the last session of the State Dental Society. A full account of the different sessions, of the papers, discussions and clinics, was written, together with a great many notes, editorials and items of general interest. All these, forming sufficient copy for a large issue, were sent to the printing office, just before the close of college work, after which the members of the Board were out of the city, until the day before Commencement. But the copy never reached the printers. So knowing of the absence of the different men, and not being able to find other copy, they printed the paper as best they could, and as the Board found it on their return. We are exceedingly sorry that such happened, but it seems to have been one of those peculiar cases where censure cannot be fastened. It was the intention to make "A Dental Society Issue" of that number, so we are especially sorry for such an unfortunate occurrence.

H. S. HUSSEY.

# MISCELLANY.

**This** departmen of the **Journal** will be devoted to practical points in the form of methods of operation, treatments, formulæ, receipes, or anything pertaining to every day practice. Contributions are solicited.

**Foul** breath arising from the mouth may be remedied by rinsing the mouth with a 3% solution of pyrozone.

**Dr. Abbé** states that nine-tenths of the malignant growths on the tongue he has had to deal with are traceable to irritation due to ragged edges of teeth.

**Lubricate** disks and strips with oil or vaseline. It will greatly lessen the heat produced by friction. Finishing burs should also be oiled.

**A noted** doctor of Boston must have been searching for a record of his ancestors when his eye met this epitaph inscribed on a southern tombstone:

"Here lies Robert Gordin,
Mouth almighty and teeth accordin';
Tread lightly over this great wonder,
If he opens his jaw, you're goner, by thunder!"

**Chloride** of zince mouth wash.

| | | |
|---|---|---|
| ℞ | Zinci Chlor | ʒ vij |
| | Ol. Anisi | ʒ jss |
| | Ol. Gaulthar | ʒ jjss |
| | Tr. Caryaph | ℥ jjj |
| | Tr. Card. Co | ℥ v |
| | Spts. Vini Rect | ℥ jjj |
| | Saccharin | grs. v |
| | Aq. Distil | ℥ ij |

(Wintergreen or peppermint) flavor to suit. Sig. Use a teaspoonful in a half tumblerful of water.

—*The Pacific Coast Dentist.*

**According** to a statistican the consumption of gold for purposes of dentistry in the United States amounts to about 1,800 pounds annually. This is perhaps the reason the gold reserve in the national treasury has been gradually decreasing. There is no need for alarm, however, in the exhaustion of this metal so long as "Wall Street" gold mines hold out.

**Rubiform.** The following is taken from the "Western Druggist," Vol. 13, p. 394:

| | | |
|---|---|---|
| ℞ | Castile soap, white | ʒ 9 |
| | Glycerine | ʒ 9 |
| | Syrup | fl ℥ 4 |
| | Water | fl ℥ 26 |
| | Alcohol | fl ℥ 26 |
| | Tinc. of Cardamon | fl ℥ ½ |
| | Tinc. of Canada Snakeroot (1:16) | fl ℥ ½ |
| | Oil of Peppermint | M 45 |
| | Oil of Wintergreen | M 45 |
| | Oil of Cloves | M 12 |
| | Oil of Cassia | M 12 |
| | Carmine qs. to color. | |

Mix the soap, glycerine, syrup and water: stir well and add the alcohol. Add the remainder of the ingredients, let stand a few days, and filter at a low temperature so that no soap will afterwards precipitate.

**From** the reports of 36 of the 43 dental colleges in the United States the following statement is obtained: Matriculates in the Freshman class, 1,667; Juniors, 1,358; Seniors, 954; and post-graduates 128, making a total enrollment of 4,107 students. Of this number 21% were graduated in 1894 and only 3% were post-graduates.

**Obtundent.** Dr. C. N. Pierce recommends the following formula as an obtundent for sansitive denture:

| | | |
|---|---|---|
| ℞ | Cocoaine | grs. v |
| | Carbolic Acid | grs. xx |
| | Chloroform | ʒ ss |
| | Muriatic Acid | M x |
| | Alcohol | ʒ jj |

**Obtundent.** At the First District Dental Society of New York, Dr. Genese treated and excavated a lower first molar, capping and filling it at the same time. The cavity was large and the tooth hypersensitive. Dr. Genese demonstrated the obtundent effect in this case of his preparation of carbolate of cocoaine, the formula of which is:

| | | |
|---|---|---|
| ℞ | Cocoaine | 4% |
| | Carb. Acid | 50% |
| | Benzoin gum | 50% |

by the aid of which he excavated the tooth painlessly.

—*Cosmos.*

D. E. **Wiber**, D.D.S., Washington, D. C., has administered the following prescripton in facial neuralgia with excellent results:

| | | |
|---|---|---|
| ℞ | Codeine | grs. ij |
| | Phenacetine | |
| | Quinine | āā: grs. xxx |

M. Fiat. cap. No. 12.

Sig. One cap. every 3 or 4 hours until relieved.

**Dr. J. Alberto del Solar**, Santiago, Chili, furnishes the profession with a local anesthetic for painless extraction of teeth. It is:

| | | |
|---|---|---|
| ℞ | Alcohol, 98% | fl. ʒ jj |
| | Chloroform | fl. ʒ iv |
| | Ether, sulf. | fl. ʒ jss |
| | Camphor | ʒ j |

M. The solution is to be applied to the gum for one minute both bucally and lingually. It is not intended for hypodermic use, and to insure the best result the gum should be carefully dried before making the application.

**Common** table salt solution is a good mouth wash in accidents due to use of nitrate of silver.

## ALUMNI NOTES.

Since last spring Dr. C. F. Metcalf, '91, has been located on upper Woodward ave., Detroit.

Dr. F. P. Watson, '89, of Marine City, called on friends and visited the college on Nov. 23d.

Dr. J. W. Jungman, class of '89, of Cleveland, O, spent Nov. 9th, 10th and 11th, at Ann Arbor.

Dr. E. L. Gedney, of '93, spent Thanksgiving week in Ann Arbor. He is located at Winnebago City, Minn.

Drs. A. W. Diack and E. B. Spalding, class of '92, spent a few pleasant days in this city during the early part of November.

His old friends and classmates will be pleased to learn that Dr. C. A. Hawley, '93, editor-in-chief of the Journal for that year, is located in the Y. M. C. A. building, at Columbus, O.

Dr. Homer E. Parshall, class of '88, is now connected professionally with Dr. Sylvester, of Berlin, Germany.

A recent letter says that Dr. W. A. V. Price, '93, has opened offices on Euclid Ave., Cleveland, in the Hower Laughton Building.

The JOURNAL is pleased to record the marriage of Dr. C. W. Adamson, '93, of New York, to Miss Emma King of the same city.

Dr. A. F. Leuty, class of '93, is practicing at Beyreuth, Syria. The JOURNAL wishes him all success in that distant country.

Dr. C. T. Whinery has been appointed as assistant to the chair of Operative and Clinical Dentistry, by the Board of Regents.

The U. of M. will be represented in Mulchausen, Alsace, by another of its graduates. Dr. C. P. Haselden has gone there to practice.

Congratulations are extended to Dr. F. W. Boyer. '93. Cards announce that Dr. and Mrs. F. W. Boyer were " at home on Dec. 5, 1894.

Jackson is not far distant from Ann Arbor. Hence it is not inconvenient for Dr. Harry P. Ball to spend an occasional Sunday in the city of his alma mater.

One of the former editors of the JOURNAL, Dr. Henry M. Bridgman, '93, is now practicing at Clinton, N. Y. The new board extends to him its best wishes.

Dr. W. J. Mummery, '92, and Miss Lena Long. both of Milford, Mich., were united in marriage Nov. 28th. Congratulations of the JOURNAL are extended to the happy couple.

A very pleasant affair was the marriage of Dr. Joseph Lathrop, Jr., '93, of Detroit, to Miss Harriet L. Davison, of the same city, on September 19th. Their wedding trip was to Denver, Col., and other parts of the west.

Dr. Homer F. Hussey, '93, editor-in-chief of the JOURNAL last year, is located at his old home, Richmond, Ind. Recent advices from there say that his prospects are very bright. The JOURNAL wishes him the fullest measure of success.

# DEPARTMENT NOTES.

A. Barnes, Jr., resorted at Petoskey, Mich., during the summer.

Mr. H. P. O'Conner, '95, is finishing his course at the Harvard ~~Dental~~ College.

Mr. F. J. Sheldon, '96, is putting in his Junior year in the Detroit Dental College.

H. B. Hinman was located part of the summer with Dr. Wing, of Howell, Mich.

Dr. W. H. Van Deman and F. E. Dodge spent their summer vacation in Wheeling, W. V.

F. von Widekind crossed the Atlantic to call on his relatives at Cologne, Germany, last summer.

J. A. Bucknall made a very pleasant trip to London, England, during the summer vacation.

F. E. McLaughlin was kept busy manipulating the forceps under the direction of Dr. C. F. Amsden, '94, at Norwalk, Ohio.

Much credit for the large increase in membership of the Dental Society is due Mr. Ralph L. Williams, chairman of the membership committee.

One-half the class is completing their course in practical histology under Drs. Huber and Van Deman, and the other half will begin work soon after the holidays.

Dr. Hall has divided the Junior class into sections and is giving each division an interesting and informal talk, in the museum, on Comparative Dental Anatomy.

Already the students are making preparations for their exit from Ann Arbor boarding houses to revel for two weeks in the good cheer of the holidays at their respective homes.

This year's Freshman class is one of the largest the college ever had, it numbering seventy, of which two are ladies. Of the foreign countries, England has sent Mr. E. E. Bubb and New Zealand Mr. W. D. Bruce. S. W. Honey had a brother graduate from this department in '90. L. R. Slawson is the brother of Dr. Slawson, '92.

Though we understand the management of the U. of M. base-ball nine has urged Mr. E. V. Deans, '96, to fill his old position next year on third base, he has had to decline owing to pressure of work in his studies.

At the last meeting of the Dental Society an interesting and instructive paper was read by Mr. H. H. Lauderdale, '95, on "Prehistoric Dentistry," proving conclusively that dentistry was practiced before the Christian era.

At the second meeting of the Dental Society for the year an interesting paper was read by Mr. J. A. Bucknall, '95, on "Impressions of Dentistry in England," gathered by him during his sojourn in that country the past summer.

Dr. Hoff is now giving to the Juniors a most practical course in crown and bridge work. After Christmas the class will take up regulating appliances and all the mechanical work will probably be done by the close of the first semester.

As vice-president of the Dental Society and chairman of its executive committee, Mr. C. L. Thuerer, '95, is making a brilliant success. At every meeting of the Society an interesting program has been rendered, due largely to his untiring efforts.

One of the most interesting and most practical programs furnished by the Dental Society was the demonstration by Dr. Hoff of the removal of a devitalized pulp with the use of cocoaine. Several valuable formulæ were given by him during the operation.

Several members of the class of '96 have not returned this year, but the number enrolled is nearly equal to last year, due to the acquisition of several students who have remained out of college for one or more years. The new members of the class are Messrs. Taft, Woodin and Sutphin.

As usual, the different classes held their respective meetings early in the year. The following officers were elected: Senior class—J. H. Neely, pres.; F. E. McLaughlin, vice-pres.; P. T. Van Ornum, sec.; and H. B. Hinman, treas. Junior class—George H. Wooton, pres.; Miss J. E. Castle, vice-pres.; and C. A. Phillips, sec. and treas.; Freshman class—F. W. Joslyn, pres.; Miss Robertson, vice-pres.; Miss Burr, sec.; and Frank R. Fletcher, treas.

No doubt this year's Juniors will be much pleased in being the first class which receive full instructions in operative techniques. The Faculty has put this course in the hands of Drs. Hall and Van Deman. Work will begin early in the second semester, and we will refer to this move in detail in due time.

On Friday evening, November 16th, Dr. Vaughan spoke before the Dental Society on "The Hygiene of the Dental Office." He urged that dentists be more thoughtful in their disinfection of instruments, citing several cases in which cause of disease could be directly traced to the use of filthy dental instruments.

Besides doing all the practical work the Seniors are at the same time busy every afternoon in the operating room. But one thing they generally "kick" on is the bad light in the clinic. This was mentioned in the JOURNAL in one of the last year's issues, but if this urgent request to the Faculty will bear fruit, we may still hope,

The Dental Society is enriched by the purchase of a neat and tasty bulletin board. This has been a long-felt want, as previous to this there has been no special place in which to display notices concerning the business of the society and thus many members fail to see the announcements. The case has been hung in a conspicuous place in the hall facing the main entrance.

A most important change in regard to the practical work has taken place. All prosthetic work which heretofore belonged to the Juniors has been transferred to the graduating class. A decided advantage, no doubt, to the seniors. To carry out this work with practical value to the student the class has been divided into convenient sections. Each member in turn is given full charge of the clinic for one day, examining each case presented, giving an opinion of work necessary to be done, whether it be the regulation of dentures, constructing of artificial dentures, plates, bridges or crowns, any misjudgment being corrected by the Professor in charge.

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# THE DENTAL JOURNAL.

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## HYPNOTISM.—(Concluded.)

BY G. H. MEAD, A. B.,
ASSISTANT PROFESSOR OF PHILOSOPHY OF THE CHICAGO UNIVERSITY.

The positive stimulus that is given by the suggestion without is perfectly normal, the tendency to carry out that suggestion is perfectly normal. The abnormal character of the hypnotic state lies in the absence of the other stimuli, the reactions upon which are what make up the normal state of consciousness. The bearing of this comes out at once in hallucinations. If I feel a hand laid upon my shoulder and turn about to see who is there and no object strikes the eye or presents itself to the hand, I assume it is an hallucination. The ground of this assumption is in the absence of the stimulus from another source. If I should continue with my back turned to the supposed individual who has laid his hand upon my shoulder, he would exist for me as really as if I turned about and saw him or entered into conversation with him. Indeed, I should have some mental picture of him, especially if I identified him in thought with some acquaintance. And, later, in recalling the incident this mental picture of my friend would enter in as a constituent part of my memory; that is, upon the suggestion of a hand laid on my shoulder, I would construct a complete situation with a visual object and environment and this because the stimulus of sight did not come in to correct a suggestion given through the fact. If, in the twilight, a friend should point out to me some dark object and call it a dog, out of the dim outlines my eye would construct through the memory images which I have of

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* Read before the 30th Annual Session of the Michigan Dental Association, June 7th, 1893.

these animals, the picture of a dog. If, upon closer contact, I should find that the object was not an animal but a stool I should recognize that there had been an hallucination due to the fact that the suggestion given me through one sense had not been corrected by suggestions coming through others. If, in the midst of a dark hall, an attendant bids me at a certain point to climb the stairs, I should raise my foot and endeavor to carry his suggestion into execution. But the failure to reach higher ground, expressed to me through the sense of touch and muscular tension corrects the illusion that I have of the presence of the stairs. In a word, all suggestions, whether received from objects or from persons, tend to fulfil themselves, and it is only the corrections received from other stimuli, that is, through other suggestions, that saves us from being at the mercy of every object and every word that comes into consciousness; or, to express it in another form, every stimulus tends to hypnotize us and fails only because of the contending suggestions that flow in through all the other senses. The peculiar character, then, of normal attention lies in constructing a single activity out of all of these tendencies to different activities and a world of consistent objects out of a thousand fleeting stimuli and as many memory images thronging in from the past. This form of attention is absent in the hypnotic state. In the very first directions which are given to the hypnotic patient he is required to abstract his thought from everything except the object presented or the suggestion offered. He is not to give his attention to the direction or the object as a part of his whole world, but that alone is to occupy the field of consciousness. The suggestibility which is supposed to characterize the hypnotic state is not due to a great degree of excitability, but to the presence of a single or a few ideas at a time in the consciousness of the patient. He has not a higher degree of suggestibility because the stimuli have a more immediate meaning for him, but because each separate stimulus comes by itself, and is given the entire field of consciousness. In this lies the difference between the two stages of somnolence and somnambulism. In somnolence the field of consciousness to use Wundt's term is not narrowed in so large a degree. The person is conscious of his surroundings. The general sensibility is, however, lowered. It is highly probable that in this condition and in the later condition of somnambulism all stimuli act with a less degree of distinctness than in normal condition. The objects seem distant and voices are heard to come from a distance. The condition is probably in this respect analogous to that of one who is just falling into a faint. This hpynotic condition, however, differs from that at the beginning of a fainting fit, or that in which we frequently catch ourselves when just going to sleep; in the possibility of keeping one thought clearly before consciousness. In the condition immediately preceding normal sleep or a fainting fit no one object is more clear or distinct than another, and the attention so far as we can speak of it wanders constantly and with surprising rapidity from one to another. In the hypnotic state one object stands out with great clearness and distinctness and the attention is fastened constantly and unswervingly upon it, while all other objects that may be in the background are so indistinct and meaningless that they have no voice in the judgments which we form. Professor Wundt has described an interesting experience which throws much light upon this state. He was an assistant in the hospital at Heidelberg in his student days and had charge of one department during the night. It happened that during one week he was called up constantly, generally only to give some customary direction which hardly required his being more than half awake. One night he was summoned to attend a woman in delirium. He arose, and, not more than half awake, started to give the customary order of a teaspoonful of a certain preparation of opium. His eye, however, caught a bottle of tincture of iodine which was standing on a neighboring shelf. The color was the same as that of the preparation of opium used, and without giving account to himself of what he was doing ordered the nurse to hand him a bottle and poured out a teaspoonful and endeavored to give it to the patient. Fortunately, the first drop or two that reached her mouth called forth a reaction vigorous enough to save her from the dangerous dose. It was only when he reached his chamber, Professor Wundt says, that he became fully conscious of what he had done. Then the terror of what he might have done and the strangeness of the whole incident impressed it so upon his imagination that all the details of it have remained distinctly in his memory ever since. He described his sensations as being those (we have already described) of one who is half asleep, when objects and sounds seem removed and indistinct. He recognized that the bottle upon the shelf was a bottle of iodine, but he associated with the medicine, especially through its color, the soothing attributes of the preparation of opium, in other words, the other elements of his idea of iodine were all absent except the name, and the activity he was carrying out, namely, that of giving a soothing potion followed irresistably upon the stimulus of the color. We can all of us, I think, parallel this with the strange thoughts and absurd combinations which we find in our thoughts when we are waked just as going to sleep. Ideas and objects which have only the remotest connection are associated in these half waking dreams because only portions of them are present in consciousness. This gives, presumably, a true picture of the entire background of the consciousness of the hypnotized person. But it differs essentially from his consciousness in the distinctness with which the particular object or action stands before him. What background and environment there is, is only sufficient to fill out this particular object and give it body.

It becomes, I think, perfectly possible to understand the hallucinations and illusions of the hypnotic state from this standpoint. It is suggested to the patient that there is a dog before him; the memory images of the dog are present from the past. There is only one light spot in his field of vision; it becomes, therefore, absolutely necessary that he should construct out of these few details and his memories the object which has been suggested. This explanation answers as well for the complete control of the physician, under which the patient lies. If told to do some particular thing there arises in his consciousness only the memory pictures and the stimuli which serve to carry out this action. This explanation serves also, I think, for the so-called negative hallucinations. The person is told that he shall not see certain objects or persons in the room. These objects, like all others in the field of consciousness, are dim. The suggestion is that he shall pass over this object. Only the boundaries of the object are distinct before him. He may fill out this gap with some other object. We have one instance given of a person under the influence of hypnotism to whom it was suggested that there was no door in the room. When, however, she passed her hand over it and was asked what was there, she answered a brick wall; she had filled out the space occupied by the door with some other object. The negative suggestion amounted in this case to a positive one and it is highly probable that in all these cases the negative suggestions, or suggestions to negative hallucinations, are, in reality, positive ones. Another instance is given in which one person in the room was suggested away, if one may use the term. The hypnotized person was unable to see the individual, but when asked to write the names of all persons in the room she included his name among them. Indeed, in all these negative hallucinations it seems necessary that the object which is suggested away must, to some degree, be present in consciousness in order that it may be avoided, so that the negative suggestion becomes in reality a suggestion to avoid the object or replace it by another. As we have seen, then, hypnotism is a state characterized by the presence of a single object or idea with a dim and indistinct background that cannot serve to correct ideas for action, but only to give the filling to those objects which are before consciousness. A gentleman whom a traveling hypnotist tried to hypnotize told me that when it was suggested that he could not open his eyes, he found his attention centering on these words, "I can't open my eyes." As soon as he carried his attention off these words the hypnotic state which begun to enter was completely dissipated. If our statement has been correct there is always some positive suggestion upon which the consciousness of the individual is centered to the exclusion of everything else. The first suggestion usually given is that of sleep, and this suggestion, as we have said before, is exactly upon the same basis as every other suggestion that is given. It is as really an hallucination as any other which is called into his consciousness. In order that this suggestion may take complete control, all the accompanying sensations of sleep are suggested—the heavy eyelids, the sense of weariness in the limbs, etc. The eye is directed frequently to some bright object or the ear toward some monotonous sound, that the senses themselves may be tired and so predisposed to sleep, but these stimuli serve in reality only as suggestions of sleep. When the consciousness of the individual has been completely absorbed with the idea of sleep, when he has reconstructed within himself the conditions of sleep as regards the indistinctness and lack of vividness of consciousness, it is then possible to take possession of his consciousness by means of any idea, and we have the complete somnambulism. Somnolence differs from somnambulism only in degree. The field of consciousness is fainter, the objects more indistinct than in the normal condition. It is, therefore, more possible to center the attention upon one object or idea to the exclusion of the others than in the normal state. Consciousness, however, is not so indistinct but that any peculiarly vivid or commanding stimulus will not bring the individual back into the normal world. He may readily fasten his attention upon the idea that he has no pain or some other object, and if the pain caused is not too great he will have no consciousness of it. Let it rise, however, beyond a certain point and he will awake.

In somnambulism, or complete hypnotic condition, the background of consciousness has become so indistinct and the attention is centered so completely upon the idea or object that is suggested that it remains completely insensible to everything else.

As we have already said, the different stages which have been introduced into this gradual descent from the full consciousness to the somnambulism simply represent different degrees. The cataleptic condition, for example, answers simply to the stage in which the raising of the arm will act as a suggestion that it be held in that position, or any artificial position given the body will act as a suggestion that it be maintained. It frequently occurs that persons who pass into the complete condition of somnambulism will not answer to this peculiar kind of suggestion. It offers, therefore, no sufficient ground for the marking off of a particular stage. Before leaving this psychological sketch we must refer to one other characteristic of the hypnotic condition—the complete loss of memory which generally occurs for all that has taken place during the somnambulistic state. In general, our memory represents the continuity of our life and assumes an unbroken series of links connecting it with that which has taken place in the past. It is a peculiar characteristic of hypnotism that it breaks in upon the continuity and that what takes place during the hypnotic state has little or no meaning from the conscious life that has gone before or comes after. This is true not only of hypnotic states but of normal sleep. The dreams that pass in the night, except those that occur immediately before waking, have no connection with the conscious states that go before, and drop, generally, entirely out of the memory. There is a gap in memory because there has been a gap in our continuous life.

What, now, is the physiological state that answers to the psychological state. As we have already said it is something that pertains especially to the central nervous system. The anæsthesia that follows from the hypnotic condition is induced by central changes. The peripheral organs and the lower reflexes are not changed. We must assume that there is a breaking up of the co-ordinations in the brain and in some sense throwing out certain tracts. Professor Wundt has assumed that the lowering of excitability, that must take place for large portions of the brain is compensated for by a higher degree of excitability of those portions which are in use and assumes vaso-motor changes by which the blood that is drawn from these first portions flows to that portion which is excited. He also assumes a like compensation in the distribution of nervous energy directly through the nerve fibers and the protoplasmic processes of the nerve cells. But this can be only a theory. We are not even sure that hypnotism is always accompanied by changes in the rhythms of circulation and breathing. It is highly probable that the changes which have been noted were due to the fixing of the attention upon the bright object, the method so frequently used in inducing hypnotism. It is, therefore, almost impossible to give any physiological statement of what must take place in the higher nervous centers corresponding with the psychological processes which we have described. Anything more than the statement of the breaking up of the higher co-ordinations which represent our processes of normal attention and the throwing out of certain tracts with a compensating degree of excitability of others would be in the realm of pure theory and would answer to no physiological fact at our disposal.

We pass on now to the practical applications which may be made of hypnotism. Its general scope is determined by its own character. As a remedy it can only work by suggestion. We can expect, therefore, that the diseases which it can reach will be in general those that are either caused or aggravated by suggestion. It applies chiefly, if not entirely, to nervous diseases or to diseased organs in so far as these lie under the influence of the nervous system, or, in other words, the functional, rather than organic diseases. I give a list of those diseases for which it is especially recommended by Hirsch's "Handbook on Suggestion and Hypnosis:" General neurasthenia, sexual neurasthenia, traumatic neurosis, insomnia, chronic headache, nervous dyspepsia, zwangsvorstellungen (compulsory ideas), hysteria, hypochondria, hystero epilepsy, St. Vitus dance, migrane, chlororis, stuttering, neuralgia, rheumatism, melancholia, chronic alcoholism and morphinism. Occasionally we find accounts of astounding cures in organic diseases as distinguished from functional diseases, and certainly one has no right to preclude the application of hypnotism wherever there is a chance.

Perhaps no better idea can be given of the usefulness of hypnotism in such diseases than in the history of a few cases.

Elizabeth W.—an artist 25 years of age. The father of the patient was healthful; the mother suffered three years from melancholia. Patient had suffered for five years from frequent vomiting, generally in the morning and then frequently after every meal. For eight weeks this vomiting had occurred every morning and she was troubled further by continued nausea and pain in the stomach. Before the vomiting she always felt strangling in the throat. Two or three times during the day she was overcome with fits of weeping and for four months before, she had had most violent attacks of weeping and loud and involuntary screaming. She had never had abdominal trouble and had never vomited blood. Status of the patient is that of a well nourished person of good color; heart and lungs normal. Hyperæsthesia of the left arm. Knee reflex is strongly exaggerated. Normal pupil reaction. Visual field in no way reduced. The pulse 96. Sensation of weight in the neighborhood of the stomach, especially below the sternum. Diagnosis, hysteria. Special symptoms, trouble in the stomach.

On the 19th of Feb., 1893, treatment began with hypnotic suggestion. The hypnosis was interrupted at first by a fit of weeping. I dehypnotized her after I had controlled the fit of weeping by threatening a stream of cold water. In the next two sittings the hypnosis proceeded undisturbed. I suggested improvement of the symptoms without important results. In the fourth sitting I commenced the use of the Faradic brush. The Faradization took place during five minutes with a pretty strong current in the neighborhood of the stomach, with a suggestion of absence of pain in the neighborhood of the stomach; at the same time therapeutic suggestion to the effect that the stomach thereafter would be unable to throw up what had been eaten. The success was perfect. Vomiting did not occur again. Suggestive Faradization was continued several times. Patient felt better, appetite was improved. Toward the end of April, during which the patient was hypnotized weekly, the patient was dismissed and since then the trouble has not occurred.

Another case. Carl B., aged 21. Student of philosophy. Patient has always been well, except when a child had convulsions once. Father healthful, mother nervous. For three-quarters of a year he had noticed that he wrote badly with a pen, while his writing with pencil remained as usual, especially in the presence of other persons, and during the last two months has been attended with constantly greater difficulty. Status. Patient shows no signs of organic disease. In my presence he attempted to write but it was quite illegible. What he wrote in my absence was better, but he said he had to write very slowly. The diagnosis was myographia.

On the 29th of May had the first sitting. Easily hypnotized. Catalepsy of the right arm very pronounced. Suggestion that he should be able after waking to draw straight lines with the pen, that his will power will be stronger and his muscles more powerful. Light massage of the hand, stroking of the fingers. Chirography much better after the hypnosis. After the next five hypnoses the condition bettered itself so that he could write his name well, without trembling. The patient says that at home he writes very slowly and with evident weakness of the arm. Chirography illegible. Within the next 14 days difficulty so far subsided that the patient was no longer troubled and was dismissed as cured.

These two cases are taken from the practice of Dr. Max Hirsch, of Berlin. I will add one more from an account given by Delbœuf.

A young man who had suffered since his 11th year from paralysis of the extensors of the left foot. This occurred in 1880. I began the treatment on the 11th of November, 1891. Easily hypnotized. I bade him stand up without the cane. He refused and his face showed the greatest anxiety. He turned his eyes toward his father as if to beg protection from him.

Finally he attempted to stand without the use of the cane, wavered a little and at last maintained his position for two minutes. The muscles were more or less atrophied; the extensors of the toes functioned only imperfectly. The tibialis anticus would not contract at all. The treatment consisted in suggestions of a vigorous and strong will and the carrying out of gymnastic exercises under the influence of hypnosis and the suggestion that the weakened organs would gradually gain strength. The boy carried on his gymnastics at home constantly, standing, sitting, getting up, striking a feather bed with the diseased limb until finally he was able to use a tricycle. From week to week there was continual progress. In one sitting he would learn this or that movement or position which he would afterwards practice at home. In less than a month he could walk two miles on a bad country road where before he was hardly able to walk a few steps, Finally, on the 10th of May, 1892, he was able to walk with hardly resting upon his cane at all.

Hypnotism has shown itself a most valuable remedy in all cases in which the functional rhythms of the system have been interrupted. Its action, therefore, upon the entire digestive process, the regulation of the stools and a large class of sexual diseases renders it a most important weapon in the armory of the modern physician. A use which is almost as important is that by the dentist, especially in the higher stages of somnolence. Here suggestion can be used as a local obtundent, and even to the extent of extraction of teeth without pain. I regret that I have been unable to collect the data upon this particular application of hypnotism and am only able to refer to the excellent statement made in the Dental Congress last year.

One other question deserves notice. Is it allowable to use hypnotism except for therapeutic purposes? It seems to me that this is a question which must be answered decidedly in the negative. It is hard to believe that both physiological and psychological defects will not necessarily follow the continued use of hypnotism except under the direction of competent physicians. It is well known that the patient is hypnotized at first with comparative difficulty, but with each successive sitting this becomes easier, until finally the patient may be hypnotized by a single look or snap of the fingers. Now, no physiologist will deny that these effects of practice represent a growing decrease of power of resistance in the central nervous system against outer influences, and it is impossible that this should continue without the lasting changes in the functional quality. It is a general principle that every variation of an organ from its normal physiological function carries with it a disposition to further disturbances.

On the psychological side continued hyptonizing means a growth in suggestibility in the waking condition. Bernheim says that such persons carry out every idea that one gives them. Every picture that one arouses in them becomes an hallucination upon mere suggestion. He himself gives an excellent example. At one of his clinics to a patient who had been frequently hypnotized it was suggested that a physician who was present had met him upon the street, struck him with his cane and taken his money from him. At once the patient repeated the story with perfect confidence that the event had taken place as suggested and maintained this against every contradiction. Then Bernheim turned to three children who were present and who had also been frequently hypnotised and suggested to them, one after the other, that the patient in question had already related to them this story during the morning. They supported this emphatically, and introduced further details into the story and said they were ready to support it with an oath. On the following day when the patient left the clinic he asserted upon his conscience that this had taken place as suggested to him, although the absurdity of the story was pointed out to him, and assured Bernheim that he remembered all the circumstances exactly.

It is hard to believe that any one with such possibilities as these before him can look upon hypnotism as a harmless tool with which to play, or would dare to use it with less caution than every physician uses in administering morphine or other narcotics.

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DR. D. W. BARKER states that a pellet of cotton dipped in a saturated solution of camphor and chloroform, placed for a few moments in the sockets of an extracted tooth, will almost instantly relieve the after-pain of extraction. To be removed as soon as the pain ceases.

# ODONTALGIA.*

BY N. S. HOFF, D.D.S., ANN ARBOR, MICH.

SEVERAL years ago, when I was younger in professional life, an older practitioner proposed as the subject for consideration by our local dental society, "What would you do with a case of toothache?" I was surprised and somewhat indignant that he should refer to this malady in such indefinite and unscientific terms, and especially to invite a society of professional gentlemen to discuss it.

During the past two months I have apparently lived in an atmosphere of toothache. It has seemed to me there was no disease so common, or one which presents so many vexing problems, or brought me so many patients. Living in a college town, I have had toothaches from almost every state and territory in the union, Canada, Germany and England, presenting almost as many varieties as patients, and when your executive committee invited me to write a paper for this meeting and refused to assign me a subject, I could not get away from toothache, and shall take pleasure in unburdening my mind even if I do bore you.

It is exceedingly difficult to define odontalgia satisfactorily and comprehensively, without qualifications. In the mind of the layman it covers all diseases of the teeth and associated parts, especially when painful. But the dental practitioner will associate the disease with numerous functional disturbances of the dental organs and tissues. The word toothache to him is comprehensive but not definite.

In the *American Journal of Dental Science*, for July, 1853, I find an article on odontalgia, by J. P. Fogg, M.D., from which I shall quote the opening paragraph for the graphic and forcible way in which it describes the malady, its historic interest and for introducing my theme.

"The simple definition of the technical term, odontalgia, is to be found in our vernacular word toothache. No theory whatever is implied in it. It simply means what it emphatically is, *a pain in a tooth.* The character of this pain is protean. It may be a slight uneasiness; it may be an intolerable anguish. It may be dull, heavy, constant like rheumatism, acute and lancinating, paroxysmal, darting, boring, throbbing. Any term of the frightful vocabulary of human suffering may be applicable to this torture. It may be cumulative, beginning moderately and increasing to intense severity, or it may at once attack the sufferer, armed in all its terrors. Yet toothache is, after all, only a symptom of some lesion, either in the pulp, the tooth, the jaw, the nerve, the brain, or the system at large."

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* Read before the Ohio State Dental Society, December, 1894.

No authoritative classification of the different phases of odontalgia will admit of a brief and comprehensive consideration, such as may be necessary to properly present the subject at this time, and I take the liberty of condensing the accepted classification and considering it under five headings simply for convenience.

First: Exposure of the dentine by accident or caries.
Second: Exposure and disease of the pulp.
Third: Disease of the peridental tissues.
Fourth: New growths in the pulp tissue or upon the roots.
Fifth: Reflex irritation.

Just why exposed dentine causes pain in the tooth we do not at present so clearly understand, as that it does. Clinical experience has practically established the fact of a wide difference in the susceptibility of dentine, when exposed in different patients to pain. Very slight exposures will cause pain in some persons, while extensive exposures in others will cause little or no pain. It is also true that at different periods exposed dentine is more likely to cause pain in the same persons, and accidentally different teeth in the same mouth may manifest differences in the degree of sensibility. The old writers accounted for pain or sensation in the dentine on the theory that it was subject to inflammatory processes. But on account of the absence of the essential elements of inflammation, this theory is not now believed. Some authors think the dentine is endowed with sensory nerve fibers, although they confess their inability to demonstrate their existence, or to trace any connection between the nerves of the pulp and the dental fibre or organic tissue of the dentine. Bödecker in his recent work, "Anatomy and Pathology of the Teeth," page 272, says: "It is impossible to admit of the existence of a connective tissue holding nerves alone in its constituent soft part. Neither have we, nor has Retzius in his recent investigations, been able to trace a direct inosculation of the dentinal fibrillæ with the axis fibrillæ of the nerves so abundantly distributed throughout the pulp tissue. As soon as we admit that the dentinal fibrillæ are formations of living matter, the same as are the nerves, all difficulties vanish in explaining the transmission of sensation from the periphery of the dentine to the nerves of the pulp tissue. Living matter is contractile. Nerves are made up of living matter, and, owing to their reticulated or beaded structure, are fittest for that transmission of contractions from the periphery to the nervous centers which we call sensation. Contraction of the dentinal fibres transmitted into the reticulum of protoplasm at the periphery of the pulp, and thence into the ultimate nerve fibrillæ,—all of which formations are proved to be continuous,—are sufficient to explain the transmission of sensation, or, speaking bluntly, of pain."

This theory whether we can accept it entirely or not, is as satisfactory as any other and has much to cause us to accept it. It is plausible and harmonizes with clinical experience and manifestations. The application of agents capable of producing contraction in protoplasm and organized tissues elsewhere, we find produce pain when applied to exposed dentine; such as cold, excessive heat, escharotics, caustics, and other chemical and mechanical irritants. All successful treatment of exposed dentine depends upon its being protected mechanically or by narcotic and anæsthetic drugs, from the irritation of these agents; or upon the disorganization of the organic tissue in the dentine so that irritants produce no impression when applied. It therefore seems clear that the theory is worthy of confidence, and all principles for treatment of sensitive dentine and from the relief of pain from exposure of the dentine should be based upon it until some one demonstrates its error or gives us a more plausible one. The technical resources for the cure of toothache from this cause are so various that any attempt to detail them here would be a burden. We rest our practice on the acceptance of the contraction theory, leaving to individual cases the selection of procedure and remedy.

The second division of our subject, *Exposure and diseases of the pulp*, presents a different and more complicated series of conditions, requiring prompt and definite treatment, as the symptoms are frequently exhibited with great energy, because of the peculiar environment of the pulp and its sensitive nature. The pulp is richly endowed with blood vessels and nerves contained in a matrix of connective tissue. There are lymphatic canals and possibly lymphatic glands. There are few arteries and veins, and these are near the center of the pulp, but the entire organ is richly supplied with blood capillaries, especially toward the periphery. The odontoblast layer on the periphery of the pulp is not highly sensitive, but the granular layer immediately beneath contains the nerve endings of the pulp nerves, and is highly sensitive. Irritation of the exposed pulp is followed by pain, depending on the character of the irritant as to its penetrating power and the severity of its action. Mechanical and galvanic shocks cause prompt and severe pain; and because of the favorable structure of the pulp the shock is quickly experienced not only by the pulp, but the general sensorium as well. Chemical irritants act more slowly, depending on their relative solubility, and the power of their impression will depend upon the characteristic physiological or chemical affinities. The pain produced in each case will correspond with the time and intensity of the irritation. *Irritation of the pulp* is always followed by disturbance of its normal circulation. The first effect is to produce contraction of the tissues and more or less anæmia, which is quickly followed by relaxation and a determination of blood to the part, congestion and incipient inflammation. This condition is scarcely pathological, and yet it requires very nice manipulation and the proper selection of remedies to prevent serious inflammatory conditions following. Prompt removal of all irritants and provision for complete seclusion, accompanied by the application of local vascular and nerve sedatives, disinfection with non-cauterant germicides, the application of an antiseptic dressing and the careful adaptation of a protecting filling are indicated for the relief of the pain and its subsequent recurrence.

*Inflammation of the pulp*, results from inoculation under conditions of general systemic infirmities, or because of excessive exposure, and irritation in consequence of mechanical, chemical or physical excitants. There are the usual symptoms of irritation and, in addition, the entire pulp takes on a persistent congested condition, which, in a measure, suspends the normal function of the pulp. There is pain, not only of the acute variety, but the tissues themselves take on a kind of lameness or hypersensitive condition, so that every pulsation of the heart is distinctly felt, causing intense and prolonged suffering. This condition is not amenable to treatment with the ordinary local treatment used for pulp irritation, at least not for curative results. The results of this affliction are somewhat varied and the prognosis is uncertain. Usually it means the utter annihilation of the pulp as a vital organ. In favorable cases, good systemic health, youth, and the absence of destructive infection, the chances of successful treatment are correspondingly better. In many cases it is practicable to save the pulp even after extensive inflammation. It is of the utmost importance that the actual conditions present should be carefully determined, in order that needed and useful pulps be not sacrificed indiscriminately on principle. And also to prevent needless suffering for the patient in a futile attempt to save pulps which ought to be subject to radical treatment at once.

The treatment of this condition for the relief from pain temporarily, can,in almost every case,be successfully accomplished by the removal, as far as practicable, of all local irritants; the application of astringent, non-irritating sedatives; an antiseptic dressing to be covered with such material as the case will indicate, to prevent further irritation and the dissipation of the dressing by solution in the saliva; counter stimulation of some of the systemic eliminating organs to withdraw the excess of fluid from the pulp, such as a saline cathartic. If this is not advisable a heart sedative will give temporary relief and enable the tissues of the pulp to recuperate and secure a more normal circulation and function. After the inflammatory condition has subsided, the pulp may be covered with a non-irritant filling material and the carious cavity with a more resistant material, one that may be removed without applying excessive force in case of a reappearance of the difficulty. The conservative treatment of pulps so diseased will necessarily depend so largely upon individual conditions, that it would be impracticable to even suggest a treatment for the varied conditions which must be met. The condition of the pulp itself, as to the character and extent of the disease; the personal idiosyncrasies of the patient, as to general health; the difficulties of exact technical manipulation; the importance of the individual tooth and the subsequent service required of it are to be taken into consideration. Placing crowns, bridge attachments, regulating appliances, or requiring constant and heavy service in any way, will be likely to thwart all efforts for the conservative treatment of teeth having had inflamed pulps. If any such service is to be required of a tooth soon after treatment, it will be better to destroy the pulp at once and avoid almost certain secondary inflammation. If the indications are that there is extensive inflammation of the pulp and it is desirable to insert cement or amalgam fillings, or even gold fillings, it will save much inconvenience and suffering to destroy and remove the pulp at once.

The third stage in exposed and diseased pulp is what is sometimes called gangrene of the pulp. We may have gangrene of the entire pulp or only of the exposed surface. Where the exposed portion of the pulp only is involved, it takes the form of a slough, with little or no pain except when irritated. This condition is not always the cause of severe toothache, but is sufficiently troublesome to require attention. The indications usually are for the entire destruction of the pulp, but a few conservative practitioners recommend excising the diseased portion, and by palliative treatment save the remaining portion. In my own hands this procedure has never been successful in permanent results. The most painful form of pulp gangrene occurs when the pulp is inclosed in the pulp chambers by fillings or debris of caries. The generation of gas in the putrefactive process creates great pressure and consequent irritation of the nerves of the pulp and may extend to the periosteum. The pain is continued, severe and somewhat vascillating, owing to thermal changes experienced through the tooth. The pulp is highly congested, and if the cause of the irritation be not removed inanition and dissolution follow. Conservative treatment of such pulps is not advisable, but the excessive pain can be reduced by making an opening directly into the pulp chamber to allow the gas generated in the putrefactive process to escape, after which the pulp can be anæsthetized and removed entirely. The root canal should then be sterilized and filled and also the carious cavity of the tooth. It is sometimes difficult to locate the affected tooth as there may be no complication with the peridental membrane, and because of reflex irritation the pain will be manifested in another tooth, or in associated organs; the eye, ear and face. Testing suspected teeth with extreme heat or cold will result in exaggerated symptoms when the affected tooth is tested, the heat serving to expand the gas which results from putrefaction, and as it cannot escape from the pulp chamber it makes pressure on the inflamed pulp tissues and consequently pain. In the same tooth the application of cold will cause pain at first by shock, but immediatly relief will come because of condensation of gas and relief of pressure, and also because of the fact that contraction of the tissues by shock forces the fluid out of the pulp chamber, and restores the tone of the blood vessels. If suppuration has not yet set in, and still there is excessive inflammation, the application of cold will produce or create pain, not only by shock, but by its stimulating effect through the vaso-motor system upon the collateral blood circulation, throwing more blood into an already congested pulp which has no room for expansion. The use of heat in such cases will relieve by lowering the blood pressure in the collateral circulation and consequently depleting the pulp. It is evident, especially to one who has tried these agents for this purpose, that great care should be exercised in their use, especially to confine them as much as practicable to a single tooth at a time. But careful use of them will result in the most accurate information. Percussion may aid some, but has no special value unless there be peridental inflammation: Reflected light will often be of service in noting the difference in opacity. The history of the case will frequently suggest much that will be of value. An accurate diagnosis will suggest the treatment without great difficulty. As an expedient, to extract the offending tooth, this would be a radical measure indeed. Conservative treatment would, in such cases, be along the line of saving a tooth without the pulp, as this organ in this condition is entirely beyond any medical treatment. The first step will be to gain access to the pulp in order to effect its removal. Sometimes it is impracticable to do this because of circumstances, proper instruments are not available or the patient's health will not admit of so painful an operation as drilling into the canal through a dense tooth or hard filling. General or systemic remedies will be indicated in such emergencies, systemic narcotics, combined with drugs which will depress the heart's action directly or lower the blood pressure by acting upon the arterial system or depleting the blood with diaphoretics, cathartics or diuretics. Dover's powder as a narcotic and diaphoretic will answer generally, together with a warm foot bath, a reclining position, and in aggravated cases a heart sedative, such as aconite. A warm poultice applied over the region of the affected tooth will relieve congestion and prevent pericemental irritation. If it is possible to secure free access to the pulp at once, the treatment is much simplified. The disorganized tissue should be thoroughly cleared away by syringing the cavity with warm water, the rubber dam put in place to isolate the tooth, and the pulp injected with a solution of cocaine and thoroughly removed. If there has been no suppuration to infect the dentine or peridental membrane, the tooth may be sterilized and filled at once. If gangrene has taken place it is better to make a dressing of a disinfectant and defer filling the canal to a subsequent sitting.

The fourth condition of exposed and diseased pulps is a somewhat rare one. *Tumefaction,* except in rare instances, is merely hyperplesia or excessive growth of the basis substance of the pulp until it protrudes from the exposed orifice of the pulp chamber. This condition is not painful except when specially irritated, and the season of pain is not prolonged. The nerve supply is scant, but the blood supply is abundant. It is simply a pathological tissue and is incapable of being restored to its normal condition and function. Its destruction is always indicated. This can best be done by anæsthetizing it with cocaine and removing by an operation. Cauterizing chemicals produce intense pains in it and can not be used. Actual and galvanic cautery may be employed, but they are more or less painful and the manipulation of the cauterants is difficult.

Toothache from disease of the peridental membrane is not uncommon. It frequently has an intimate relation to diseases of the pulp, already considered. In fact the majority of diseases of the peridental membrane which cause toothache are the result of destructive inflammation of the pulp. This organ is easily inoculated from a diseased pulp, because of the intimate relationship of the two organs. Its environment is similar to that of the pulp, its nerve supply is not so rich, but it has a very liberal blood supply. When congested by inflammation it thickens and lifts the tooth in its socket, so that unusual pressure and percussion from the occlusion of the tooth serves to exaggerate the already irritated tissue and consequently it becomes exceedingly painful. If the affection is mild in type and acute, it may not cause great inconvenience, but is usually exceedingly painful. It is sometimes produced by mechanical and external irritants, such as blows, over-malleting, regulating, wedging, application of clamps, etc. In such cases recovery will be prompt after the removal of the cause of irritation. If the cause be infection from an inflamed or suppurating pulp, or the forcing of debris of a putrid pulp through the apical foramen of the root, or the continued action of irritant or caustic chemicals, a serious inflammatory result may appear, varying in all degrees from irritation to suppuration and infection of the contiguous tissues of the jaw and face and correspondingly and variably painful. In the beginning of inflammation of the peridental membrane the tooth elongates because of congestion; pressure on the tooth produces pain; as the inflammatory process succeeds the pain increases and changes from tenderness to acute pain, and then to a throbbing or jumping character. There seems to be a more powerful heart beat, and if the patient exerts himself the rapidity of the action is increased. If suppuration takes place there is a general pyrexia and nervousness, and the patient is exceedingly uncomfortable.

The treatment of incipient and acute pericementitis due to inflammatory action set up because of its association with an inflamed pulp, would, of course, depend upon the treatment of the pulp. The removal of the irritated pulp and the local application of counter-irritation will be sufficient to cause it to subside. But when the peridental membrane itself has become affected by inoculation and a destructive inflammatory process has been set up in it a more difficult disease for treatment is encountered. Sometimes its course may be aborted by the continuous local application of counter-irritating blisters, and systemic depleting and disinfecting remedies, saline cathartics and antipyretics. Too often the disease must run its course to suppuration. When this is the case all possible means for hastening the process should be employed, the most effective being poultices of various substances to keep the parts warm and moist, thus assisting in the production of putrefactive agencies and the relaxation of the resistance power of the tissues molecularly, so that the pus shall be formed quickly in sufficient quantity to burrow its way through the tissues toward the surface, when by the use of the lance it may be drawn off and with it much of the active agency causing the inflammatory condition. The releasing of the pus will usually give immediate relief. Little further medication is indicated, except to keep the sinus made by the pus open and clean. This should be done with warm water containing some active germicide in solution, until resolution has taken place. If the abscess has been of long standing and there be necrosis of the bone, its removal is indicated, as is also the use of local stimulating remedies.

*Calcific growths* in the pulp chamber and on the roots of the teeth are a more frequent cause of pain than we realize. The symptoms are not so markedly manifest as in inflammation of the pulp or peridental membrane. The pain is not severe nor acute, but is more continuous. Calcific deposits in the matrix of the tooth pulp, are due to the irritation of the pulp through exposed dentine or cementum from caries, abrasion or recession of the gums. No inflammatory process takes place in the pulp, but an abnormal functional excitement exists, due to this external irritation through the denuded dentine. When these deposits form in the connective tissue of the pulp or on the walls of the dentine no excessive pain is experienced. But it frequently happens that owing to a hyperæmic condition of the pulp, these formations take place in the capillaries or in the nerve tissues producing considerable pain. The pain in such cases may be slight in the tooth itself, but by irritation of the reflexes pain is manifested in other, even in somewhat remotely situated tissues, such as the eye, ear, the shoulder, the sides of the body, etc., but generally facial neuralgia, which is difficult to locate, as the teeth and muscles of the face and throat are all more or less implicated. The diagnosis is difficult as there are no apparent local symptoms. Teeth with large cement or amalgam fillings should be carefully inspected, also teeth largely denuded of enamel, dentine or cementum. Heat and cold will reveal hypersensitiveness and may, by exaggerating the paroxysms of pain, disclose the affected tooth. The treatment is radical, either the removal of the pulp or the extraction of the tooth. Secondary deposits on the roots of teeth are not frequent causes of pain. They are common in advanced age, especially when there has been considerable disease of the peridental membrane. The exact cause of the disease is not well made out and it is much a question whether the process in itself is a disease at all. It is not painful, but has by some authorities been supposed to have much to do with those obscure facial neuralgias which can not or have not been traced to other sources. The treatment must be preventive, in relieving all irritable condition of the peridental membrane, or radical extraction of the teeth.

*Reflex irritations* are important factors in medical practice, and more or less attention has been given to these affections by dental practitioners. They are exceedingly difficult to diagnose by the dental practitioner, because an irritation in a very remote part of the body may manifest itself prominently in a dental organ with no evident cause. Diseases of the eye, ear, nose, throat, brain, cord, the thorax, abdominal and pelvic viscera, to say nothing of many constitutional diseases such as malaria, gout, syphilis, etc., are liable to be the cause of localized pain in and about the dental organs. These reflex irritations of the teeth frequently show themselves in perfectly sound teeth, but more frequently a tooth structurally weak from some cause will be the one selected. The treatment of the affected tooth may give relief, but many reported cases seem to indicate that extraction of the tooth is the only adequate cure. The treatment of these conditions is one of the points at which the dentist and physician should act together. Many serious mistakes have been made because of too much specialization. There is no question but that diseases of the dental organs cause and continue many serious nervous and organic systemic affections in spite of the best medical treatment. But this is not on our subject.

There is one cause of toothache that I have been unable to classify, because I do not understand it and can not find any authority on the subject. As near as I can state it, it is acute irritation without destructive inflammation of the peridental membrane. It generally follows the removal of the pulp by either operative procedures or chemical corrosion and the immediate filling of the root. Especially is it present when irritating chemical germicides or antiseptics have been used to sterilize the root canal. It sometimes follows the treatment and capping of exposed pulps and insertion of fillings. I am not able to briefly outline the symptoms, except to say that there is usually pain without soreness, although soreness may be present. The pain is more or less constant. If from a capped pulp, it is sometimes neuralgic. It certainly is irritation of the nerves of the dental tissue surrounding the tooth, but of what nature I am unable to determine. It is exceedingly practical in its bearing on this subject and is becoming more prominent as the use of rapid destruction and antiseptic treatment of pulps increases. My notion is that it is a secondary effect of the use of irritant anæsthetic or germicidal drugs.

### DISCUSSION.

DR. H. A. SMITH: I remember at a meeting of the Mississippi Valley Dental Association which I attended a long time ago, Dr. Watt suddenly asked Dr. Atkinson what he would do in a case of toothache? Dr. Atkinson hesitated a moment and then replied, "Show me the case."

If we want to receive any benefit, practically, from this discussion, so I would say—show us the case. The patient applies to be relieved of pain, and in order to give relief promptly, a correct diagnosis is all important. To do this properly, especially if we need to make a differential diagnosis, requires more time than is usually given by the busy practitioner. For example, let us take a simple case of partial acute pulpitis, caused by caries. We assume the pulp is exposed. In order to apply the remedy the cavity must be carefully excavated, washed and dried, and then some one of the usual anodyne remedies applied. Following this treatment a stopping should be placed in the cavity, in a way to avoid pressure on the pulp. If the hyperæmic pulp is to be relieved by depletion, the puncture should be preceded by applications of cocaine. Now all this, as I have said, requires more time, unless an emergency case, than can be taken from our patient already in the chair. Would it not be better, more satisfactory, to both the patient and dentist, to reserve the case for our consultation hour, or reserve sufficient time for careful treatment, on appointment with the patient.

Doctor Hoff has treated the subject in a general way quite exhaustively. The classification he makes of pulpitis is similar to that which Bödecker gives in his recent work, and from a clinical standpoint seems very satisfactory.

I cannot do better in closing, perhaps, than to commend Dr. Bödecker's book,* "Anatomy and Pathology of the Teeth." This work embodies the scientific investigations and experiences of a busy and accomplished practitioner during a period of twenty years. To the thoughtful and intelligent dentist the study of Dr. Bödecker's book cannot fail to be largely helpful in the routine of daily practice. May I add it is a matter of congratulation that this able work is the product of a dentist pure and simple. Dr. Bödecker has only the degree of Doctor of Dental Surgery.

## POT-POURRI.

BY W. XAVIER SUDDUTH, A. M., M. D., D. D. S.
DEAN OF COLLEGE OF DENTISTRY OF THE UNIVERSITY OF MINNESOTA.

### ROOT CANALS.

Antiseptic treatment of root canals is perhaps one of the simplest things in surgery if properly understood, and just why so much doubt should hang around its accomplishment has always been a puzzle to me. If we admit the cause of sepsis to be germ life, then successful treatment of infection lies in destroying the germs or preventing their developement when once they have entered a canal. Germs live on moist organic substances; a thoroughly cleansed canal affords no food for these microscopic plants to live on. They can not grow except in the presence of moisture. Dentine is an inorganic substance and affords neither food or moisture for the nourishment of infectious germs, hence the line of treatment is very plain.

1. Mechanically remove all or as much organic material from the pulp canal as possible; at the first sitting wash out the canal thoroughly with $H_2O_2$, being careful not to force any of the decomposing material beyond the apical foramen; dress the canal with some slightly stimulating antiseptic medicament such as oil of cassia, cinnamon or eucalyptus, stop lightly with cotton and sandarac or Hill's stopping, telling the patient to remove it if there is a feeling of pressure, and return the next day for treatment.

2. If there is any odor on the cotton twist placed in the canal repeat the process of cleansing with $H_2O_2$, and again dress with oil of cassia or cloves. The rationalé of this line of treatment is to remove all organic matter from the canal and get the dentine in a healthy condition; repeat the stopping, sealing the tooth tightly with Hill's stopping, and if there is any sign of pericementitis paint the gums with a saturated solution of aconite and iodine and give the patient a small capsicum plaster and tell him to place it on the gum over the root if there is a sense of fullness and return at once for treatment, but if the tooth is comfortable to come back at the end of a week.

3. If, on removing the root dressing, the canal seems "sweet," as evidenced by the lack of any odor, other than the essential oil used, dry with a root drier, (Evans' or Wooley's) and fill with a gutta percha point or cement and fill the crown with cement, or, if there is urgent necessity, place a permanent filling at once and depend upon treating through the gum if any subsequent trouble should arise.

4. The rubber dam should be applied at each treatment and all instruments used in the canal should be sterilized by heat, boiling, before being introduced into the canal, and great care should be used not to force putrescent matter through the apical foramen.

5. The foregoing outline of treatment is for cases where the pulp has died from exposure and is in a putrescent condition when presented for treatment. In cases of devitalization by the operator no such treatment is necessary. The arsenious acid should be applied directly to the exposed pulp, the tooth cavity sealed and left for twenty-four hours. It should then be opened and the cavity syringed out with tepid water, followed by three per cent. of $H_2O_2$ and again sealed and left for one week for the separation of the pulp from its fibrillæ, when it may be readily removed intact. The rubber dam should be used at each sitting.

6. If there is no hemorrhage dry with root canal drier and fill at same sitting. If hemorrhage is present it indicates a potent foramen of considerable size which must receive special treatment. The bleeding may be stopped in most cases by the use of cocaine injected into the canal or gum. If this does not suffice place a saturated twist of cotton (pure carbolic acid) in canal and leave until the next day; remove carefully, dry and

fill with cement, being careful not to start hemorrhage by instrumentation. If care has been used in manipulation, infection will not occur. If suppuration intervenes the dentist knows who to blame and should use more care the next time.

7. Canals that cannot be filled by pumping thin cement into them may be safely left by saturating them with the chloride of zinc only.

### GOLD FILLINGS.

1. Use gold adapted to the character of the cavity to be filled. No better foil is made than the old "soft" gold of our forefathers for filling cavities where the walls are all intact.

2. Start all fillings with soft gold. Do not use retaining pits but depend upon the shape of the cavity for retention of filling. Use curved "assistant" to hold gold until it can be locked upon the opposite side of cavity.

3. Use cohesive foil where contour is to be restored and platinized gold where any considerable wear is to fall. Finish with strips and leave with dull finish made by pumice.

### ALUMINIUM PLATES.

1. My personal experience with aluminium as a base has been limited. In the college clinic it has given good satisfaction. It makes a good substitute for gold. I look upon a cast aluminium plate as about the ideal plate next to continuous gum or all porcelain. On account of the difficuly of casting the metal, except by experts, I doubt whether it will come into general use, unless a more satisfactory method for casting it than has as yet been devised, is discovered. The patents that cover its use will also prevent its general adoption.

### PREPARATION OF ROOTS FOR CROWNS, ETC.

The rapid advance made in the conservation of the roots of teeth has been the result of a general desire to do away with plates and escape the fatigue of large gold fillings with their sure failure in time.

Dentistry has turned from the era of *Marshall Webb* to a more sensible treatment of restoration. To enter into the discussion of crown work other than to treat the subject and principle in a resumé such as this is desired to be would be impossible. We must content ourselves with a few principles.

1. When more than one third of a tooth has been lost by decay or fracture and the root can be placed in a healthy condition then it should be crowned. But how or with what kind of a crown depends upon the conditions presenting.

2. Porcelain or porcelain faced crowns should be used in the front of the mouth and shell crowns on molars and some bicuspids, although in ladies' mouths I would advocate using porcelain faces on bicuspids for the cosmetic effect. In all banded crowns the enamel should be removed with suitable scalers and the band made of better than 22k gold and fitted snugly at the gum line and allowance made for setting it higher, on the root, at the final setting. By so doing the band will be stretched by the increasing size of the root and thus made to fit very tightly. This method of fitting bands was adopted by the writer in 1880 and a set of enamel scalers devised at that time for the purpose of removing the enamel. These were shown at the meetings of several dental societies and the manner of their use fully demonstrated. During the past winter we also advised the use of swaged aluminium crowns for practice work in college clinics.

### CEMENTS.

The field for usefulness of cement as a filling material is largely confined to temporary or test work and intermediate or in combination with some other material. We have advocated the use of a cement made by Dr. Seikel, of San Francisco, which seems to present some most excellent qualities. The formula is as follows:

*Powder*—Chemically pure zinc is mixed with a portion of oxide of zinc and oxidized by keeping it at a white heat for from six to ten hours. Then add phosphate of aluminium until the mixture is of the consistency of putty, then bake till it is fully fused when it looks like porcelain; then pulverize finely.

*Fluid*—Add aluminium to chemically pure glacial phosphoric acid and boil down to the consistency of syrup.

### COMBINATION CEMENT AND METAL FILLINGS.

Where considerable wear is to come on a cement filling aluminium filings may be added to the fresh cement mixture or added to the powder before mixing, in equal bulk, and thoroughly incorporated and the mixture made as usual. If the above cement, or any first-class cement, is used the addition of the aluminium filings will not materially detract from the working qualities of the cement. After setting the filling should be finished with disks and the surface thoroughly burnished. It will present a metallic surface and will withstand attrition fully equal to a metallic filling. In time it may need reburnishing, but if it is an occlusal surface the ordinary use will keep it polished.

### AMALGAM.

In the clinics on amalgam we demonstrate the use of Flagg's filling materials and show how by using his method of wafering, fillings may be finished at the same sitting by using a pine stick, whittled to a feather edge, and with wet pumice the surface can be left comparatively smooth. A still finer polish may be added at a subsequent sitting by using strips of rubber upon which wet pumice had been spread by the fingers. We advocate mixing the alloy with just the right proportion of mercury to make an even mixture and then holding this in the hand to prevent its further setting until used. The excess of mercury to be removed with bibulous paper.

## MISCELLANY.

It is possible to produce chloroform narcosis when one is asleep. Recently a child seven years of age was chloroformed while asleep, and a tooth extracted. The child awoke two hours afterwards.

She couldn't be impressed that "anything was the matter," till assured that she had an aggravated case of chronic pyorrhea alveolaris and stomatitis, with a happy family of micro-maggots in every drop of secretion in the mouth. "Oh, doctor, if I have that, for God's sake cure me as quickly as you can!" "Ten dollars, please."

Local anæsthetic:

℞ Chloral Hydrate,
Gum Camphor------------aa grs, lxxv
Cocaine Hydrochlorate---- grs. vi

M. Triturate in a mortar until liquified. Sig. Use as a local anæsthetic on the skin, mucous membranes or hypodermically. This may be used after opening an abscess, in the pocket after extracting a tooth, for removing pus. Use it also in pyorrhea pockets before removing deposits. In odontalgia, in any solution up to 20 per cent. cocaine may be used.

HERE is a local anæsthetic which produces no bad after-effects. He had adjusted himself in the chair and was in the act of opening his mouth for my forceps, when he suddenly bethought himself: "Hold on, doctor, a moment! I never go into any serious undertaking without asking my Maker to see me through." He got out, kneeled at my chairside, and prayed that it would not hurt—and he declared that it did not.

J. W. GREEN.

FRANK B. NORRIS, Helena, Mont., gives us a method of making steel crown dies. He says, procure a piece of round stuff, half-inch for molars, three-eighths for bicuspids. Take them to a blacksmith and have them cut into as many three-inch pieces as you want dies. Each piece is then heated to a redness and one end driven into the crown die plate, which will give a steel cameo of the cusps and sulci complete. The dies are afterward placed in a vise and filed to any shape or size desired, being careful not to have the neck smaller than the crown. For either the steel or fusible metal dies a block of close grained pine or spruce is all that is necessary for a counter. By driving the die into the end of the block you have as fine a counter as one would wish. A little oil placed in the counter will prevent the crown from sticking. The cusps of a seamless crown may be swaged with these dies.

A PELLET of cotton placed on a small bur, dipped in pumice, will be found effective in polishing gold fillings.

A PHYSICIAN of eighty-three years claimed that three rules of hygiene had prolonged his life; they were: To eat little; take much exercise, and be gay.

A GOOD method to keep a matrix in position when the tooth opposite the approximal cavity to be filled is absent, is to place the matrix on the tooth and fill in the space of the absent denture with soft magnifique, which soon hardens and holds the matrix firmly in position.

ASBESTOS. Cut sheet asbestos into shreds and saturate with hydrochloric acid. Boil for a time, stirring at same time to thoroughly break up the fibres. The hydrochloric acid may now be washed out with water and the asbestos dried. This process renders it to almost a powder which may be moulded into various forms, and uses, filtering funnels, soldering pads, etc.

"Got 'er toothache, Mary?"

"Yep."

"Have yer got a cavity in it?"

"Nop. I got cotton in it."

To painlessly remove the live pulp: Take a drop of oil of cloves and add sufficient cocaine to make a paste, and introduce it into the pulp, after having first put the rubber dam on the tooth; then, by taking a broach, slowly work the paste down; with a bur open up the cavity slowly, and in ten or fifteen minutes the pulp can be removed. When arsenic has been applied to the pulp and the patient returns with pain, better satisfaction is obtained from the application of cocaine.

To remove the stains of tincture of iodine, from either the hands or napkins, apply strong ammonia. The stain of nitrate of silver on either the hands or napkin can be easily removed by covering the spot with tincture of iodine, wait a few moments, then apply strong ammonia and rub well.

"Please, doctor, I have a terrible toothache."

"You have come to the wrong office, sir; I am an occulist; I only attend to diseases of the eye."

"That is the reason I have come to you, sir; it is an eye-tooth that is aching."

A New use for Gutta Percha.—Gutta percha can be softened almost to a liquid in boiling water to which a little glycerine has been added. In this softened state it will not only absorb tannin and chloride of iron, but also benzine, carbolic acid, salts of mercury, and other hæmostatic and antiseptic remedies. It will retain its efficiency indefinitely. After the gutta percha is saturated with the drug, allow it to cool and form into pellets or roll into sheets. To use it soften in warm water.

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To polish metals use crocus mixed with flour of emery, finishing with rouge. This will cut the metal evenly.

Aluminium plates allowed to stand in a warm solution of caustic soda will take on the frosted appearance so much sought after.

# EDITOR'S TABLE.

The dreaded period—the mid-year examination time—has passed. All the classes of the department have been examined in their respective studies and the work for the remaining half year has started.

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The wealth of literature at the disposal of the dental student steadily increases. It is nothing unusual now-a-days to hear of a new magazine devoted to dentistry. Among the latest devoted to the profession may be mentioned *The Dental Digest.* It will be published in the interest of the Dental Protective Association and its ally, The Dental Protective Supply Company.

* * *

An infection seems to have spread throughout the department and has attacked so many that the number afflicted would form a small army. Where this infection started—here or elsewhere—is not known, but that it has caused havoc and is still spreading, is shown by careful inspection from day to day in the department. The infected have formed a club and its nom-de-plume is the "Whisker Club." That it will be a success there is no doubt.

* * *

There seems to be a little misunderstanding regarding articles written for the JOURNAL. Two or three have signified their willingness and desire to write such. While all articles are desired by the board some may not be accepted. This is the case also with articles written by request of the staff. If, after a careful examination by the board, they have been satisfactory, they will be published, otherwise not. Articles rejected are returned privately. In doing this the board thinks it has made no mistake.

* * *

The question frequently heard is "Where are you going to locate?" This seems to be the all-absorbing topic among the Seniors. Looking back upon the graduates of the U. of M. since the establishment of the department and gradually looking forward to the present time is gratifying. Men of prominence have sprung up throughout the country and in point of number the U. of M. ranks among the first. It seems that no mistake was made by these men in choice of location. May the class of '95—individually—make the same wise choice.

* * *

There has always been, and there still is, manifest among the students, a desire to begin work of an advanced nature; those in the simpler mechanics wishing they were at the crown and bridge work, and those doing the latter wishing they were in the operative department. While this desire to progress may be commendable in itself, yet the student should do that work which is in hand; do it uncomplainingly and do it well. The course in this school is so arranged that as the student advances in his course so he advances in the acquirement of manipulative skill. The average student, upon entering, possesses this skill in a limited degree. He begins by doing work comparatively simple in nature; handling impression materials, pouring plaster casts, flasking, vulcanizing, articulating, grinding gum sections, casting and swaging metals and finally soldering. He then advances to crown and bridge work and to the construction of regulating devices, and is eventually initiated into the mysteries of operative dentistry. At each step forward the work becomes more complex, and more skill is required. Let each student, therefore, do the work as arranged; do it to the best of his ability and in this way progress in the acquirement of skill, for in the possession of this skill lies one of the great secrets of success in dentistry.

* * *

A number of journals of this year have contained editorials upon health and upon how the dentist should live. These articles relate to the practitioner, but it will not be out of place to bring it before the students in our own college. In time they will be in practice and will need to adopt those rules which make a "sound body." "A sound body, a sound mind," holds true and will hold true *ad infinitum.* Health is man's birth-right and as such he accepts it. The advantages open to the practitioner for developing the body are not as many as to the student in college. The student's life is more or less a sedentary one and care must be taken that his health is preserved. A well developed and regulated system—one of vigor—at our present time may, in years to come, prove to be of the utmost value. Certain rules must always be observed in the preservation of health, but to class them under one head as rules never to be broken would be folly. No two persons possess constitutions alike, and what is good for one may be bad for the other. Regular habits should be observed. By this we do not mean that the dentist should be too methodical in his habits—as rising at a certain time and then following throughout each day those rules which he has determined must not be broken at any cost. It is certainly gratifying to visit the new gymnasium and see the number in attendance from our department. A regular course of instruction is taken, and those parts needed to be exercised most are not forgotten. The whole department would be better were they to take this daily exercise. Let each man do that which he thinks is for the best, and profit by his experience.

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## DEPARTMENT NOTES.

Geo. E. Hathaway, '94, is at Saline, Mich.

Dr. W. V. Wolvin, '94, is practicing at Rochester, Mich.

Geo. W. Kenson, '94, has changed his location to Mansfield, Ohio.

Dr. Hoff has been giving the Junior class bridge and porcelain crown work.

A. W. Hall, '94, recently of Grand Rapids, is now located at Quincy, Mich.

Geo. F. Fiddyment spent his Christmas holidays in the office of Dr. Stewart, of Joliet, Ill.

A hot water heater is an addition to the operating room which the students much appreciate.

Dr. Carl Jung, of Berlin, Germany, assistant to Prof. W. H. Miller, visited the department last week.

A movement is on foot to attach a dental department to the University of Texas. Still they multiply.

The Junior class is experiencing their first thesis writing upon various dental subjects assigned by Dr. Taft.

One is reminded of the "wild and woolly west" by a peep into the fresh dent laboratory. The familiar reminder is the fine hirsute displayed by the members of the "whisker club."

Mr. O. C. Carr, who has been visiting J. H. Billmyer, has returned to Indianapolis, where he completes his junior year in dentistry.

Several members of the Junior class have purchased their Senior outfit and are putting in their spare time in the operating room.

Our genial and popular treasurer of the Dental Society has been suffering from an attack of a disease popularly called "Pink Eye."

Miss M. A. Lohr is welcomed back to the Junior class. She was compelled to remain out of college the first semester on account of sickness.

Dr. F. B. Dawley,'94, was in the city the latter part of January and called on friends and made the college a visit. Dr. D. is practicing in Willianstown.

Mr. H. Prinz will sail for Germany about April 15, where he will give a course in crown and bridge work, returning to graduate with the class of '96.

1895 brought to the Freshman class two new students, A. McInnes, M. D., from the Argentine Republic, South America, and D. Templar, from Canada.

Several members of the Junior class are availing themselves of the opportunity to elect extra studies, the favorite work elected seeming to be organic chemistry.

Dr. Haidle will have charge of the Freshman class in their course in crown and bridge work, Dr. Hoff having turned the work of demonstrating that course over to him.

The summary measures taken to procure order in the Law Department have had a wholesome effect. We wonder if like results might not be attained if similar judgments were meted out to the dents.

In their laboratory work the Freshmen have finished the following pieces: Partial upper and lower; in gum section, full upper with rubber base, full lower, Watt's metal base with rubber attachments, and full upper and partial lower, plain teeth, with aluminium and Watt's metal bases respectively. The next demonstration will be on a full upper and lower brass swaged base plate, the teeth being attached with solder.

There is much dissatisfaction among the members of the Freshman class in regard to the manner in which their hours are arranged, they having an 8 o'clock recitation four times each week and 5 o'clock lectures three times each week.

The class of '97 is the largest class by five of any that have yet matriculated, excepting only '94, which class entered with eighty-five members. '96 numbered sixty-seven, and the class of '95 started out with a membership of fifth-eight.

The Junior class resumed its studies with Dr. Hall this semester with Black's Dental Anatomy as a text-book, which will be used until the second section is through histology, when the whole class will tackle Week's Manual of Operative Dentistry.

During the illness of Dr. Thuerer, Baraboo, Wis., Mr. C. L. Thuerer, '95, took charge of his brother's dental office. Mr. T. returned to college a week later from his Christmas vacation, and a little worse for the wear and tear of professional responsibility.

Drs. Van Deman and Whinery will locate next year at Toledo, O., where offices have been engaged in a new office building in that hustling city. While the JOURNAL regrets to see the college lose two bright young men, it wishes them the utmost measure of success.

In visiting the gym. one will notice a large number of dental students indulging in various exercises, principally those which develop the muscles of the wrist and arms. It is evident when they get hold of a molar something must give way, and they do not intend it to be a lack of muscle protoplasm.

We are sorry that we are compelled to go to press before the election of officers of the Dental Society has been held. But from the amount of interest taken in the society during the past semester, undoubtedly much enthusiam will be manifest at the election and a competent and enterprising set of officers chosen.

Mr. W. Taft, who entered with the present Senior class, remaining out a year and joining the Junior class this year, has been compelled to return to his home in Cincinnati, O. Three weeks ago Mr. Taft suffered from a slight attack of appendicitis, the recurrence of which will necessitate an operation. He will, however, return to graduate with the class in '96.

The Juniors quietly came to the conclusion that a good old fashioned "rush" is not worth 10 cents. Consequently the Freshmen come and go in peace, the doors swing on their hinges as usual, the plaster is intact upon the wall, and the windows still continue to throw light on the subject,—all unmolested.

J. W. Kasbeer, '93, writes the JOURNAL from Normal, Ill.: "I am working into a nice little practice here and also have the position of dental surgeon to the Illinois Soldiers' Orphans' Home, located in this city. The asylum cares for about four hundred children, ranging in age from six months to fourteen years."

The following are the ladies who were entertained by the dental frat men at the Nineteenth Annual Ball: Delta Sigma Delta—Mrs. Van Syckle, of Detroit, Mrs. Odell, of Toledo, Mrs. Howlett and Mrs. N. S. Hoff, of Ann Arbor, chaperones. Misses Saxon and Burnham, of Jackson, Misses Scoville and Moore, of Ypsilanti, Miss Williams, of New York City, Misses Howlett and Jones, of Ann Arbor, Miss Odell, of Toledo, Miss Blanch Weimer, of Kalamazoo, Misses Van Syckle and Winifred Scripps, of Detroit, Dr. George J. Dennis, of Chicago. Xi Psi Phi—Mrs. Babbitt and Mrs. Brown, of Jackson, chaperones. Misses Freeman, Hutchinson and Hatch, of Lima, O., Misses Agnes and Dorothy Masson, Misses Potts and Babbitt, of Jackson, Misses Mignon and Clara Lapham, of Cadillac, Miss Snell, of Saginaw, Miss Foreman, of Ypsilanti, Miss Ernestine Robinson, of Lansing, Miss Hasler, of Detroit, Miss Matthews, of Chicago, Miss Slawson, of Bay City, Miss Garner, of Cincinnati, O., Miss Frothingham, of Buffalo, Miss Florence Tinker, of Ann Arbor.

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# METHODS OF BLEACHING TEETH.*

BY ELIZABETH VON BREMEN, '95.

We are frequently called upon to restore the normal color to teeth which have by some means or other been discolored. But to be able to do this properly we must first of all understand the cause of discoloration.

We need not take into consideration the change of color brought about by increasing density of the tooth structure, nor that caused by pigmentary deposits in the enamel, as both of these are beyond the reach of treatment, and indeed, require none, while on the other hand deposits on the teeth can be removed easily and stains from fruit or medicinal agents will disappear readily as long as the enamel remains intact. If, however, coloring matter enters the dentinal tubules of a living tooth, it is a difficult matter to remove or bleach it, and as most of the agents used for this purpose have an injurious effect on the pulp, I should never dare attempt the bleaching of such teeth, at least not with the substances now in use.

The change in color following death and decomposition of the pulp is very marked, and, as it is permanent and very unsightly, it must be viewed differently from either of the preceding conditions.

The death of the pulp results in the death of the contents of the dentinal tubuli—the dentinal fibres, which are but continuations of the outer layer of cells of the pulp—and after death has occurred decomposition takes place rapidly, thus producing discoloration.

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*Read before the Dental Society of the U. of M., Jan. 18th, 1895.

If the pulp is devitalized and at once removed, and the tooth properly treated and filled, the discoloration will be very slight, as only the contents of the tubuli are left to disintegrate or to mummify. If, however, the dead pulp be allowed to decompose entirely, as is often the case when it dies in consequence of an accident, the products of decomposition will permeate all the minute anastamosing channels in the dentine and the larger interglobular spaces, and as the enamel is translucent this will give to the tooth a very unsightly appearance. Various agents have been used at different times to restore the teeth thus discolored to their normal color; many of them have been discarded after a time because of inefficiency or because their use was deleterious to the tooth substance.

About thirty years ago KCn was used by a number of dentists, and, as they claim, with very good results, but its use has been practically abandoned because of its being such a powerful poison. Various acids have been tried but have proved entirely unsatisfactory, as they injured the inorganic structure of the teeth. Nitric acid is sometimes used to remove the stain of mercuric oxide, which is often found under an amalgam filling, but it must be applied with caution, in a weak solution, and its use should be followed by a washing with ammonia water. The substance that has been in use for the longest period of time and has proven most satisfactory is chlorine. Its bleaching property depends upon its power to liberate nascent oxygen from water by combining with the hydrogen. It is usually generated from chlorinated lime, or hypochlorite of lime—frequently but erroneously called chloride of lime—$Ca(ClO_2)_2$. As this decomposes very rapidly it is difficult to obtain a good article. The compound should be dry and have a strong odor of chlorine. It should be kept tightly bottled to prevent contact with the air. To ascertain the bleaching power before using it, the indigo test may be tried. A small portion of chlorinated lime is added to a test tube full of indigo solution, and this is followed by the addition of some strong acid. If it bleaches very slowly or not at all, the chlorinated lime has lost most of its bleaching property and has become in part or entirely worthless.

If chlorinated lime cannot be obtained in desirable quality, aluminium chloride may be employed instead. By moistening it with peroxide of hydrogen it yields its chlorine. Any acid will liberate chlorine from chlorinated lime, but great care should be exercised in selecting one that will not injure the tooth substance. Tartaric, acetic and oxalic acids have been used, and the latter especially has been highly recommended for this purpose. Some operators use it alone for bleaching, as it discolors hæmatin, the coloring matter of the blood, quite rapidly, but as this constitutes only a small part of the decomposed organic matter it is safer to use it in combination with chlorinated lime, except in cases where in consequence of a severe pulpitis, rupture of the blood vessels has occurred and the hæmatin gives to the tooth a pinkish appearance, when it may be used alone with good results. The acid in question may be quite strong or somewhat diluted, depending altogether upon whether the operation is to be a rapid or slow one. Oxalic acid is said to act best in a 10 per cent. solution, while acetic acid may be used in nearly full strength.

Whatever the bleaching agent may be, the rubber dam should be applied to the tooth that is to be bleached, and the cavity and root canal should be thoroughly excavated and dried. The apical foramen and the upper part of the root should be closed with a gutta percha or zinc chloride filling and the remainder of the the root canal and the crown cavity thoroughly washed with aqua ammonia, to remove all fatty matter that might be present; then rinsed with distilled water and dried with hot air. After these precautions have been taken, the chlorinated lime is introduced and moistened with the acid solution, avoiding, however, the use of steel instruments, as Cl and O attack them violently and the salts so formed discolor the tooth very rapidly. A fine wooden tooth-pick is often quite sufficient to introduce the material. Gold and platinum instruments have also been advocated for this purpose.

The application must be repeated until the desired effect has been obtained. This can be done at the same sitting, or within a day or two, sealing the cavity in the meantime with gutta percha or cement.

After the tooth has regained its normal color the cavity should be washed with alkaline water, thoroughly dried with hot air; the root should be filled with gutta percha or, preferably, oxychloride of zinc, and the crown with cement, to avoid the task of removing a gold filling in case re-discoloration should occur, which is not likely to happen if each step in the operation has been performed with care.

Another method for bleaching is the application of sulphurous acid, which is obtained by mixing $Na_2SO_3$, and after introduction into the tooth, $HBO_2$ (boracic acid) and moistening them with $H_2O$. A chemical reaction takes place, the liberated $H_2SO_3$ deoxidizes the organic matter and forms $H_2SO_4$. To apply these substances, the tooth is prepared as for the use of chlorine, but their action is slower, and they should, therefore, be allowed to remain in the cavity for a day or two, a gutta percha filling preventing the entrance of moisture. Not many years ago the use of peroxide of hydrogen ($H_2O_2$) was advocated by some for the bleaching of teeth. Its action is based on the fact that when $H_2O_2$ comes in contact with any decomposed or dead matter it breaks down to form water and free oxygen. Nascent oxygen is a powerful bleaching agent, and an antiseptic as well, and as it has no injurious effect on the tooth itself $H_2O_2$ would be a very desirable substance to use if it were not so unstable. To avoid the trouble of having it prepared for each operation, a solution of $H_2O_2$ in ether has been put on the market under the name of Pyrozone. This solution can be obtained in various strengths, 25–5–3 per cent. being the most common preparations. The 25 per cent. solution is said to be the best for dental purposes, but the 5 per cent. and 3 per cent. solutions are also frequently used. Pyrozone is easily applied, works rapidly and gives very satisfactory results.

After the tooth is carefully prepared for the operation, washed, dried and thoroughly excavated to open up the tubuli, a pledget of cotton saturated with Pyrozone is introduced and left in the cavity for a few minutes. Then a second application is made, and so on until the tooth is restored to its normal color. After drying the cavity with hot air it is ready for the filling. Failures with Pyrozone are due, I believe, less to the inefficiency of the substance than to the fact that it is employed in the wrong place. Where an already oxidized substance is to be bleached peroxide of hydrogen and Pyrozone are entirely out of place; in such cases Cl or $H_2SO_3$ should be resorted to. But where bleaching can be affected by oxidation Pyrozone is the ideal substance.

It is often quite difficult to bleach teeth satisfactorily, and it should always be borne in mind that it is impossible to restore translucency to a dead tooth. The coagulated contents of the tubuli may be whitened, but cannot be vitalized again. The operator should also never forget that the rapidity of bleaching depends a great deal upon the density of the tooth substance and upon the degree and duration of discoloration. The denser a tooth the slower it will discolor and the slower also will the bleaching process be performed, and the sooner after the death of the pulp this is removed the less discoloration will be noticed and the easier is the tooth bleached. In order to be able to notice even a slight improvement, it is advisable, before the operation begins, to select a porcelain tooth corresponding exactly in shade with the tooth that is to be bleached, and comparing them after the operation. If proper care is given to each step in the operation, and if both operator and patient have a good supply of patience at hand, success will usually be their reward.

## CAUSES AND TREATMENT OF PYORRHEA ALVEOLARIS.

BY MARY B CRANS, B. S., '95.

The disease under consideration is, next to decay of the teeth, the one most frequently encountered by the dental practitioner, and both its etiology and treatment should be of interest to the dental student. A great diversity of opinion exists as to the cause of this disease, the number of theories advanced being almost as great as the number of men who have written on the subject. Most of the theories advanced may be classified as follows:

1. Local causes.
2. Constitutional causes.
3. Local and constitutional causes combined.

Those writers who regard it as a local disease, pure and simple, explain the benefit derived from constitutional treatment on the ground that any local disease is always ameliorated to a greater or less extent by placing the general system in a state of health.

In order more readily to understand the local causation theory, permit me hastily to cover the anatomy of the diseased part. The alveoli are lined by a continuation of the periosteum which covers the maxillary bones. The root of the tooth from the apex to the neck is covered by a more delicate membrane, the peridental membrane, which receives its nourishment partly from the apical vessels, and partly from the submucous layer of the mucous membrane, of which it is a continuation. The superficial layer of the mucous membrane disappears at the neck of the tooth.

There are numerous causes that may lead to inflammation about the roots of the teeth, as the presence of salivary calculus, ill-fitting plates or clasps, uncleanliness of the mouth, application of rubber dam, ligatures, clamps, separators, etc. When the inflammation has begun, swelling would be prevented by the unyielding bony walls of the alveolus and tooth on either side. The resultant pressure cuts off nutrition to the peridental membrane, which in turn sloughs off. Suppuration takes place in the endeavor to throw off the dead tissue; pus pockets form about the teeth; the gums become deep red and retracted; the teeth separate, loosen, and finally drop out, the tendency of this disease, if not interfered with, being always toward an edentulous arch.

The constitutional theory is being widely favored at the present time. Among the systemic diseases influencing the progress of Pyorrhea may be mentioned, diseases of the circulation, dyspepsia, catarrh and gout. Gout is found as a frequent accompaniment of Pyorrhea, and it is the tendency of the writers of to-day to narrow the constitutional causes down to this one disease. They reason somewhat as follows:

There are really two forms of Pyorrhea Alveolaris. One is a local disease and may be caused in the way just explained. In this form, the disease always begins at the neck and passes downward, while calculus found in the root of the tooth originates from the saliva. It may be cured by local treatment.

The second form usually starts from near the apex, and is caused by the deposit of serumnal calculus about the roots. Dr. Pierce has had this deposit, in different cases, analyzed by reliable chemists, and in every instance the deposit was found to consist of calcic urate and sodic urate, with a little calcium carbonate and phosphate. This proved the deposit to be an exudate from the blood. Gout is a disease characterized by an excess of uric acid or alkaline urates in the fluids of the body, supposed to be due to imperfect tissue metabolism. These urates are deposited first on the articular surfaces of the body, where they cause pain and swelling. When these gouty deposits are analyzed they are found to contain the same constituents as serumnal calculus. This, together with the frequent occurrence of Pyorrhea in connection with those persons afflicted with the gout, causes the inference that Pyorrhea is merely a local manifestation of the gouty diathesis. This form cannot be cured by local treatment alone.

Finally let me mention a very ingenious theory advanced by Dr. Patterson. He argues that Pyorrhea is an oral catarrh, and that the deposits found in connection with it are of the same nature and origin as the calcific deposits found in nasal catarrh.

*Treatment:* Whatever its cause, the disease is infectious, spreading from tooth to tooth in the same mouth. It can be conveyed by means of instruments from patient to patient. The pus swarms with bacteria, but as yet no specific germ has been found. Thorough sterilization is therefore important. For this purpose use mercuric bichloride solution, 1 to 2000, or hydrogen peroxide followed by mercuric; or a 1 to 500 to 1 to 2,000 solution of mercuric bichloride in hydrogen peroxide. Also sterilize the instruments and keep them in antiseptic fluid during the operation.

Carefully remove all tartar from the roots of the teeth, finishing one tooth before beginning on the next. As soon as finished thoroughly wash out the pocket, to remove all debris that might remain behind and cause irritation. When the tartar has been removed wipe out the pockets with an acid, as 25% sulphuric acid, to dissolve out the diseased portion of bone. Apply it with stick carved to chisel-shape. This should be followed in a few moments by an antacid, as sodium carbonate. At this point Dr. Truman advocates packing the pockets with a paste made of sulphate of quinine and water, which acts as antiseptic and protective. This paste is to be removed the next day and the pockets once more cleansed.

It is important that an antiseptic mouth wash should be used, not only during the treatment of the disease, but continuously. For the gums do not hug as closely to the teeth after this disease as in normal condition, and hence form an excellent lodging-place for particles of food, bacteria, etc. Unless the mouth is kept antiseptically clean disturbance may occur again.

Listerine is valuable in this connection. Dr. Truman recommends the following:

℞ Hydro-napthol ---------------------- grs. xx
Alcoholis ---------------------------
Aquæ ā ā ---------------------------- ℥j

Sig.—One-half teaspoonful to a small tumbler of water, to be used twice a day—in the morning and before retiring.

For constitutional treatment Dr. Pierce advises the use of citrate of lithium and carbonate of potassium. These if persistently used will oxidize the uric acid to urea, or an easily diffusible urate, which is then eliminated by the kidney.

If the teeth are loose it will be found necessary to secure them firmly in place. This is usually done by means of ligatures. Dr. Rhein advocates the use of a gold bar for this purpose, secured in place by gold fillings. Dr. Atkinson recommends the following appliance. Strike up copper caps, making them continuous so as to embrace all of the affected teeth, and ligature them into place with copper ligatures. These caps should extend from the occluding surface well up on to the buccal or lingual, and are made of copper plate about 1-64 of an inch in thickness. The unpleasant taste can be obviated by the use of sodium bicarbonate, (one drachm to four ounces of water), used as a mouthwash. The advantages of the last two methods over ligatures are that they will not cause further irritation, and at the same time hold the teeth more firmly in place.

It is sometimes said that the only cure for Pyorrhea Alveolaris lies in the extraction of the affected teeth. But though an absolute cure can seldom be obtained, the disease may not only be arrested in its destructive progress, but the condition of the mouth and the affected teeth can be much improved, and the discomfort relieved. It is often strong teeth, which have resisted decay to an unusual extent, that fall victims to this insidious malady. If, by careful treatment, these teeth can be preserved, it is our duty as dental students who hope to disgrace neither the profession we are about to enter, nor our *alma mater*, to study carefully all legitimate means that may tend to this end.

# REPLANTATION OF TEETH.*

BY HARRY B. HINMAN, '95.

Before entering into a consideration of this subject, it would be well for us to have a clear idea of the difference between replantation, transplantation and implantation, as the terms are not synonymous.

Replantation is the process of replacing a tooth in the original socket from which it has been previously removed.

Transplantation is the operation of inserting into a natural socket, a tooth from some other position in the mouth, or one from the mouth of some other person, or from the mouth of one of the lower animals.

The operation known as implantation involves the formation of an artificial socket in the alveolar process, or in the maxilla proper in the case of edentulous jaws, and the insertion therein of a suitable tooth.

Both replantation and transplantation were practiced to a considerable extent during the latter part of the eighteenth century, especially by the celebrated anatomist, Robert Hunter. Because of many unfavorable results, however, the operations were practically abandoned during the early part of this century and were only practiced in a few isolated instances, until within the last decade.

Replantation has been successful in a larger number of cases than have either of the other two operations, and when used under proper restrictions and with proper precautions, by a careful operator, it is attended with excellent results in the majority of cases in which it is employed.

Replantation is indicated in cases of accident, where, as often occurs, the teeth have been forced from their sockets. Also in instances where a tooth has been extracted by mistake. It has also been found valuable as a means of curing chronic alveolar abscess of long standing. These abscesses often resist, because of crooked roots or small root canals, the most persistent and skillful treatment.

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* Read before the Dental Society.

The only means of saving the tooth in such a case is to either extract it and replant, after the proper treatment, or to trephine through the alveolar process and excise the apex of the root where the abscess occurs. It seems to the writer that the latter operation must require more skill of manipulation, and be less certain in its results, as it will be much harder to remove all of the remains of the abscess sac and pieces of bone, and one is apt to leave sharp projections on the root, which will be a constant source of irritation.

Replantation has also been adopted in some cases where there were troublesome roots to be removed, and which were impossible to withdraw without first extracting the adjoining tooth.

Care must be taken in the selection of the patient, as the operation will rarely succeed in those of nervous, excitable temperaments, or in persons having a predisposition to inflammatory conditions, or those who are afflicted with anæmia, tuberculosis or syphilis.

It should never be used in any of these cases, for even under the most favorable conditions the operation is by no means an assured success.

The operation should be performed with the same care in regard to cleanliness and guarding against infection from septic material that is employed in the most important surgical operation. This is imperative, as there are a number of cases on record where patients have been inoculated with tetanus, syphilis and erysipelas during the operation of implantation. Cases are also on record where pyæmia has been produced from the pus formed in suppuration set up by the operation.

The tooth, before replantation, should have its pulp removed and the pulp chamber and root canal thoroughly filled. For this purpose a number of materials, among them gold, gutta percha, oxychloride of zinc and oxyphosphate of zinc have been recommended, each of them having their firm adherents, in whose hands their use meets with marked success.

In the matter of filling the root canal, replantation has marked advantages over trephining for the cure of alveolar abscess, as we know by experience it is very difficult to perfectly fill a root canal while the tooth is in the mouth. Many operators, before replacing the tooth, excise the portion of the root on which the abscess occurs and where the pericementum is destroyed.

When this is done the end of the root should be carefully rounded off and polished, so that it cannot irritate the tissues with which it comes in contact. Some even go to the extent of burnishing a gold cap over the end of the root, but I can see no advantage in this method of procedure.

If there has been an abscess on the root of the tooth the abscess cavity should be curetted out, and the alveolus carefully cleansed from all blood clots, and thoroughly disinfected by a solution of mercuric chloride (1–1000), or some other equally efficient sterilizing agent.

The tooth must also be placed in the disinfectant for a sufficient time to make it perfectly aseptic, before replanting it in the alveolus. It is then replaced in the alveolus, forcing it firmly to position, and securing it to the adjoining teeth by means of wire ligatures, which in turn are secured by oxyphosphate, or by a gutta percha splint previously prepared.

This is necessary as the tooth requires firmness of position and absolute rest, just as does a broken bone, in order that healing may take place. As Dr. Kirk aptly puts it, "we need to so control the vascular excitement that it shall not exceed at any time the degree necessary for the repair of the wound, and the encapsulation of the root."

When the tooth has been recently extracted, and the operation has been carried on aseptically, we may expect reunion to take place within a week or ten days sufficient for the safe removal of the splint. In other cases where the repair does not take place so readily and suppuration is produced it may take several weeks before the tooth has become sufficiently firm to permit its being left unsupported.

Some operators, instead of filling the root canal completely, insert a gold drainage tube therein, thus providing an outlet for any pus that may be formed. After all discharges have ceased the tube is filled by means of a gold wire of the proper size.

There are several theories as to how the replanted tooth is retained in its socket:

1st. That the pericementum is revivified. This theory, while it has had many adherents, seems to be utterly untenable in cases where the tooth has been out of the mouth a sufficient time for the pericementum to have become dried, as is often the case.

2d. That the socket contracts on the tooth, and it is thus held in position mechanically.

3d. That osseous material is deposited around the root.

4th. That true anchylosis occurs.

The third certainly does take place, and the fourth may occur in cases where the pericementum has been destroyed, but where it is not there seems to be a reunion of the pericementum with the surrounding parts, this union probably taking place in much the same manner as in skin and bone grafting.

The idea that anchylosis takes place in the human mouth is combatted by many in the profession, but the clear ringing note given by percussion, and the extreme rigidity of the teeth in certain instances, certainly seems to point to the fact that anchylosis has taken place.

When the life of the pericementum has not been destroyed, its vascular connections are established. The tooth thus receives a certain amount of nutrition in this way, so that we can be more certain of a long period of usefulness in the tooth than when its vitality is entirely destroyed.

The great source of final failure in successful replantation lies in the fact that frequently, in a period ranging from one to six years, their roots are absorbed by means of osteoclasts, in a manner similar to that in which the roots of the deciduous teeth are absorbed, and, as a consequence, the tooth has to be removed.

When this takes place, however, another tooth may be transplanted to the socket which will do good service for a similar period, and this may be repeated from time to time as occasion may require.

In conclusion I would say that while the operation is not always successful, and does not last, as a rule, more than half a dozen years, it is probably as permanent and satisfactory as crown or bridge work would be, and should, like it, be used in many instances.

While implantation and transplantation are very difficult operations, requiring the skill of the oral surgeon, replantation is within the reach of the average practitioner, and there are no doubt many occasions when we all may use it to advantage.

# PRIMITIVE DENTISTRY.*

BY H. H. LAUDERDALE, '95.

Of late years dentistry has made such phenomenal strides along the path of progress as to raise itself not only to the rank of the professions, but to place itself in a position second to none in talent, investigation and usefulness.

We are indeed proud to be numbered in its ranks and hope that we may both as a body and individually do much to further its interests and progress. In the midst of these endeavors, however, it may not be unprofitable to pause a moment and glance backward to its primitive condition.

Indeed, it is encouraging to note the growing desire to become conversant with the ancient as well as the modern history of dentistry in its several departments. We are apt to think of dentistry as the result of modern research and ingenuity. But when one looks up the early literature on the subject, and reads of the recent discovery of wonderful surgical instruments in the ruins of Pompeii, instruments that have been re-invented to meet the demands of modern surgery, and examine the productions of peoples whom we have believed to be entirely ignorant of our replacing and healing art, one is inclined to call a halt before expressing an opinion on the condition of dentistry centuries ago.

The data on this subject are necessarily scant, so much so that many are inclined to think ancient dentistry a myth. There are several reasons for this. Among many peoples to whom we would look for evidences of early dental work, it has been the custom to cremate the bodies of the richer classes and so no doubt many specimens were destroyed.

The dental work in these cases, if there was any such done, would represent the highest grade of work performed at that period. There remain for us but few evidences of this kind, and for these we are indebted to the archæologist. The evidence of ancient writers is fragmentary. Little dependence can be placed on the writings of travelers, as they did not always have sufficient knowledge to discriminate between ornamentation of the dead and real prosthetic operations.

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*Read before the Dental Society.

From the scanty data, however, even now existing, there can be no doubt but that dental operations were performed thousands of years ago among peoples, many of whom in social status were scarcely more than barbarians.

Let us first look for evidences of prehistoric dentistry in Egypt, which has cradled most of the modern arts and many of the lost ones. Ebers, the great Egyptologist, says that she had teachers of dentistry 3,000 years ago. Here at least the principle of subdivision of labor was carried to excess, and when every art and profession was handed down from father to son, and every calling was hereditary, the practice of dentistry seems to have been in the hands of a special class of practitioners. How well they were acquainted with the diseases of the teeth it is needless to ask. Certain it is that they made some attempts to restore lost teeth.

According to a recent number of some dental journal, one of the mummies of the Egyptian kings taken from the tombs was provided with a set of upper artificial teeth, the plate being made of carved wood closely fitted to the mouth and the teeth represented by brass bosses or studs.

Sir Spenser Wells, the great English surgeon, is said to have related the story of a dentist in Egypt who had seen the teeth of mummies filled with a kind of fusible metal, while the English archæologist, Dr. Forbes, asserts that he has seen mummy teeth filled with gold. Belzoni, noted for his discoveries in Egypt, principally of the antiquities of the Fourth century, informs us that besides ivory and wooden teeth found in tombs and fastened on gold, teeth were also found filled with gold.

Dr. Van Marter states, however, that these specimens which for years were asserted to be gold fillings have been found, by removing the ashes, to be not fillings, but strips of flat gold bound around groups of teeth. If the latter be true it is strange that the first statement was made. Even the most casual observer could distinguish between a band and a filling.

The loss of the immense library which was burned at Alexandria in 640 can never be estimated. No doubt in that vast collection of manuscripts were many relating to medicine and dentistry. Nearly all the Egyptian records up to that time were then lost.

From Etruscia much can be gleaned regarding the condition of dentistry at as early a date as 400 B. C.

Dr. Van Marter, an American dentist residing in Italy, made several years ago some most interesting and valuable discoveries. In some ancient tombs near Civita Vecchia, on the Mediterranean coast, he discovered dental appliances which established the existence of skilled dentists in prehistoric times. These tombs dated back some 400 or 500 years before the Christian era.

Drawing No. 1 represents the anterior view of a device for holding in position three superior artificial teeth by banding them to adjoining natural ones. As is shown in the drawing, the two central incisors were evidently carved from the tooth of some large animal to fit the space and were well executed. Fig. 2 represents No. 1 in a position to show the missing artificial first bicuspid and the adjoining natural teeth which had already crumbled to dust when this most interesting relic was unearthed. Fig. 3 represents a partial denture taken from an ancient Roman tomb, also dating back 400 years B. C. The remaining tooth was evidently a natural one, as was no doubt the missing one. It represents the early Roman method of replacing two inferior incisor teeth on the Etruscan plan. Fig. 4 is No. 3 reversed giving a view of the position of the missing artificial tooth, and the manner of holding it in place. The gold band in these devices was very soft, made so presumably for the purpose of more easily slipping the rings over the natural teeth when adjusting the piece in the mouth.

The latest Etruscan tomb was discovered in 1886 at Capida Monti. The entire contents of the tomb were purchased by an American dentist and presented to Dr. Barrett, of Buffalo, N. Y. The specimens were interesting to the dentist as a type of the teeth of a prehistoric age. Some of these teeth are in a remarkable state of preservation, and in each of the molars is a cavity from caries that must have existed when the individual was alive. Besides these teeth there were three bound together by a gold band, and also the crown of another, a central incisor, bound in the same way. The tomb contained other antiquities which were sufficient evidence of the high rank held by its occupant, and which shows that these dentures were of the best the period afforded. According to von Helbig this collection represents a period of at least 2,600 years ago.

These pieces prove, says Dr. Barrett, that dentistry is one of the most ancient of the professions, and the evidences of decay in these prehistoric teeth go far to disprove the notion that decay of the teeth is a modern evil inflicted upon the race through modified and artificial food habits.

Renan also writes of an interesting relic found at Sidon. He says: "But that which was most interesting was the upper portion of a woman's jaws showing the superior cuspids and incisors united by a gold thread. Three of the incisors seemed to have belonged to another person, and to have been placed here to supply the missing ones." This piece, if found as claimed in one of the ancient vaults, proves that the art of dentistry was rather advanced in Sidon, and also that the disease of the gum, *scorbut de terre*, so common in Sidon at the present time, existed in those days.

Whether the pure gold bands encircling several loose teeth and bound to these by delicate wire passing around them are evidences of early attempts at correction of irregularities, is doubtful. If they are, then that operation dates back to the Sixth century before the Christian era. That they held teeth in place which were made irregular by looseness from wasting of their socket tissues is more probable, and that they served to hold dental substitutes in place there can be no doubt.

The Greeks learned what the Egyptians knew, and doubtless the science of dental surgery emigrated from Egypt to Greece, as did nearly all knowledge. Homer tells of Esculapius, a surgeon who lived about 1,200 B. C., and who used a narcotic to produce insensibility when extracting teeth or performing other minor operations. He, too, it was said, was the first to teach the art of tooth purging and filling. A statue of gold was made of him, and after his death he was called the god of medicine.

It has been claimed that these ancients were also acquainted with the art of healing dental caries by filling the cavity with gold, and that the British Museum contains skulls taken from Grecian tombs, and that the teeth in these skulls are unmistakably filled with gold.

According to the words of the famed archæologist, Belozoni, the Greeks wore artificial teeth of sycamore wood, which had been fastened to the adjoining natural ones by ligatures of gold or silver, and that many of the decayed natural ones were filled with a clay-like substance which became remarkably hard and durable.

Eristratus speaks of an instrument made of lead (for extracting teeth) which was suspended in the temple of Apollo. This would seem to indicate that teeth were only drawn when they had become sufficiently loose to yield to this feeble instrument.

Aristotle asserted that the males, in both the human species and in various animals of the lower classes, have more teeth than the females, that only the anterior teeth are shed in man, and that the molars are not shed in any known animal.

The written history of dentistry in eastern Europe can be traced back as far as the time of Hippocrates who lived in the Fifth century B. C. He tells us that it was practiced in his day, and the discoveries made in the tombs built at that time prove the truth of his assertion. In his pursuit of the study of anatomy he was wont to visit the burial grounds of the cities in which he lived and examine carefully the bones and teeth he found. The accounts of these investigations form an important part of his anatomical writings. He describes them in the functions and principle diseases of the teeth and mode of treatment, both by operations and by dentifrices. Of their early development he had no correct ideas. He mentions in his work a method of fixing gold teeth with wire.

Galen, who lived in the Second century A. D., wrote the best account of teeth that had yet appeared. He taught that teeth were formed during gestation and that they remained concealed in the alveolus until after birth, that the molars of the upper jaw had three roots and those of the lower jaw but two. The cuspid teeth were spoken of by him as opthalmic or ocular, because of a nervous connection with the eye. He describes at length their forms, functions and evolution, and states that though some have thought otherwise, the teeth are to be accounted bones, and he doubts not that they are endowed with sensation, "having proved it by his own."

In the voluminous writings of the Latin poets frequent reference is made to artificial teeth. Certain it would seem that the ladies of the Imperial City were acquainted with the use of artificial teeth and had recourse to them to aid the charms of beauty.

Martial, of the First century, writes to Lelius, "You are not ashamed to purchase teeth and hair," and adds that the toothless mouth of Egle was repaired with bone and ivory and that Galla, more refined, removed her teeth during the night.

Horace in one of his satires speaks of two sorceresses thus: "But they ran into the city, and with exceeding laughter and diversion might you have seen Canidias' artificial teeth and Sagants' tête of artificial hair falling off and the herbs and enchanted bracelets from their arms."

The remarks of Ovid and Virgil on this subject prove beyond a doubt that dental prosthesis was a known art to the Romans.

In the records of nearly every nation may be found scattering references to persons who devoted time and attention to the teeth. There can be little doubt but that the ancients were most anxious to hide the ravages of dental disease, both from a practical and æsthetic standpoint.

Recent excavations at Pompeii have brought to light a set of dental instruments dating back as far as 76 A. D. They consist of forceps and tweezers of various patterns. They appear to have been intended to be used as aids in the use of wire or strings for binding loose teeth in line so that they would be firmer, and also for the purpose of extraction by means of strings.

From these early times nothing can be found relative to the progress of dentistry up to the Sixteenth century. During these dark ages no attention seems to have been given to either medicine or dentistry.

This, then, is a brief sketch of the early history of the profession, which, in the language of the late Dr. Holmes, "has established and prolonged the reign of beauty; it has added to the charms of social intercourse and lent perfection to the accents of eloquence; it has taken from old age its most unwelcome feature, and lengthened enjoyable life far beyond the limit of the years when the toothless and purblind patriarch might exclaim, 'I have no pleasure in them'."

# BACTERIA OF THE MOUTH.

BY C. H. BAILEY, '96.

The mucous membrane of the mouth is peculiarly adapted for the growth and multiplication of bacteria, for not only are the essentials of heat, moisture, a constant supply of oxygen for those forms which require it, present, but also food, the latter being supplied by the saliva and such particles of the ingesta as may have remained after a meal. If it were possible to conceive of a perfectly sterile mouth it is easy to see that it would quickly become a swarming-place for micro-organisms, owing to the facts that air is continually passing through it, and also food and drink, in these actions countless numbers of spores being received, which, sooner or later, give us growths of bacteria. That the atmosphere is laden with living particles is undisputed, and it is needless to emphasize the fact that our water, drinking it, as most of us do, without boiling, and our food, although it be partly sterilized by cooking, contain many spores and germs. It has been demonstrated that the saliva as it flows from its ducts is sterile. We have, therefore, no species derived from the glands themselves; hence we are safe in saying that all bacteria found in the oral cavity are derived from the sources of air, food and drink.

It has been said by Dr. Miller, of Berlin, that there are over one hundred different species present at one time or another in the human mouth. Six varieties can always be found there and these have been termed "Mouth Bacteria Proper." They have the peculiarity of not growing on any of the usual culture media, all endeavors at cultivation—and thousands have been made—proving unsuccessful. Even media composed of glue made by boiling decalcified teeth will not afford a growth. The explanation for the failure to cultivate these germs lies probably in the fact that these organisms are susceptible to very slight changes in the culture media and also that no one as yet has succeeded in constructing a media sufficiently similar to that found in certain mouths to admit of cultivation.

Of all the forms found in the oral cavity many are saprophytic, but, on the other hand, there are a number which are pathogenic. The Staphylococcus pyogenes aureus and albus, and the Streptococcus pyogenes—the common pus-producing forms — are frequently encountered in the oral cavity. Dr. Black, examining the saliva in regard to pyogenic bacteria, found them present in many cases. In the saliva of ten healthy persons he found the Staphylococcus pyogenes aureus present seven times, Staphylococcus pyogenes albus four times, and the Streptococcus pyogenes three times. The material was obtained by scraping the tongue or any part of the mucous membrane with a sterilized platinum wire. In some cases he found staphylococcus in all parts of the mouth, while in others he did not succeed in finding them at all, although he believes that they might be discovered in nearly all mouths if the latter were examined with sufficient care. Dr. Black states that he but seldom found other pyogenic forms in the mouth. "As dentists," he adds, "we must take into consideration the fact that pyogenic bacteria are generally present in the oral cavity and endanger every wound which we make in it."

In 1891 Sanarelli showed that normal saliva has the power of destroying the vitality of a limited number of certain pathogenic germs, including the Spirillum of Asiatic cholera, the Bacillus of typhus fever, and two varieties of pyogenic bacteria.

It is an interesting fact that pathogenic germs may be found some days in the mouths of healthy individuals and the next day not found at all. Last year an examination made of the bacteria found in the healthy throats of 350 children in New York City disclosed the presence in eight cases of the Löffler Bacillus of diphtheria, and the germ causing pseudo-diphtheria was found in twenty-seven cases.

The results of bacteriological knowledge teach us several very important lessons. It should be our duty personally to render the mouth as aseptic and sterile as possible, and also to impress upon every patient the necessity of keeping this organ as clean as brushes, water and a proper dentifrice will accomplish it. In so doing we not only lessen the possibility of personal infection in every patient, but we also, to a certain extent, destroy a center of disease, and in that way lessen the number of germs which will later be cast out to become particles floating in the air, a further menace to mankind.

## EDITORIAL:

For the first time in the history of the Journal a strictly students' issue is published. It was decided at a recent meeting of the editorial board to limit the articles to members of our department. With each publication of the Journal for the past four years the students have contributed articles, the July number, '93, and March number of this year excepted. The contributions for the latter number were by professors of three different colleges; Dr. G. H. Mead, of the Chicago University; Dr. N. S. Hoff, of the University of Michigan, and Dr. W. X. Sudduth, of the University of Minnesota. Their articles were of interest to the general public and of great importance to the dental profession. That the Journal has the support of the leading members of the faculties of these colleges it may well be proud. It is often thought that if papers are to be of value to the profession they should be written by graduates and not by undergraduates. So far as known the Journal is the only dental publication in the United States edited by students, and as such it should be supported by them. We believe that from among our number we have sufficient talent to write upon subjects of interest to those in college and perhaps to those already in practice. It is noticeable that the Senior class furnishes most of the articles and that all but two have been read before the Dental Society. An examination of the various papers shows care in their composition and thought. While one or two of the subjects treated have not been lectured upon thoroughly all are worthy of our careful consideration.

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In another column will be seen a notice to the effect that a joint meeting of the State Dental Societies of Ohio, Indiana and Michigan, will be held in Detroit on June 18, 19 and 20. That this meeting will be the most enthusiastic and the most largely attended of any meeting ever held in the west, excepting only the World's Columbian Dental Congress, is evident from the preparations now being made. It is unfortunate that a programme is not at hand, but this much may be said, that papers are to be read and clinics given by some of the most representative men in the profession from the three states named. Not only will each state society send large delegations, but a number of prominent men of Chicago are now perfecting arrangements whereby a considerable delegation from that city will be present, while quite a number of notable individuals from the east are also expected. The date of the meeting is peculiarly fortunate in that it gives opportunity for the students of this College to be present, all work in the department being completed by June 14. It will be the opportunity of years for many of them and should not be allowed to pass. Each student should make special efforts to be present. Delegates from outside the State of Michigan and from outside the city of Detroit will naturally be guests of Michigan and of Detroit dentists, and that the guests will be well entertained is an assured fact.

* * *

THOSE who frequent the general library have been heard to ask why the dental students are not seen, to any extent, in that building. It is a question easily answered, for, owing to the generosity of Dr. Ford and other friends of that department they have one of the most thoroughly equipped dental libraries in the country. On their catalogue are over 600 volumes, including 170 text-books, and during the present college year, up to date, 645 books have been drawn and consulted in their library in the dental building.—*U. of M. Daily.*

Comment on the above article would seem useless, for the *Daily* has clearly and succinctly stated the reasons why the dental students are not seen in the general library. When it is taken into consideration the large amount of laboratory work included in each and every year of our course, aside from the carrying of as many hours of lectures as students of any of the other departments, it is obvious that our opportunities for doing general reading are extremely limited; and, in fact, most of our students prefer adding to their knowledge of dentistry while they can have access to so complete a library, conscious of the fact that in no city in which they may locate will there be such an accumulation of dental literature as can be found in the dental department of the University of Michigan.

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WHAT seems to us like an expedient measure is the changing of the time of meeting of the Dental Society from Friday to Monday. This is undoubtedly a desirable change, for on the former evening occurs not only nearly every social event connected with the University, but also most of the entertainments given in the various places of amusement in the city, and hence those who are desirous of attending the meetings of the society are compelled to lose the benefit accruing from attendance at other places. This change will without doubt give a new impetus to the society, and in connection with this subject it may be opportune to remark that we think the society is not living up to the lines marked out by its founders. Unquestionably the original idea was the bringing together of the dental students for the purpose of reading and discussing papers written by themselves—to help its members in becoming proficient in taking part in the discussions in the different national, state and city societies. While the talks and demonstrations given by the professors of the department and other friends of the society are very interesting and instructive, we cannot help but think that the society would do better work if it followed the lines laid down by its originators.

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It seems strange that while all other public schools in the state are displaying the American flag, that of University Hall is kept furled and hidden from view.

## In Aid of the Department.

**Dentists who have quantities of extracted teeth will confer a favor upon the Dental Department by forwarding the same to the college in care of either Dr. L. P. Hall or Dr. A. W. Haidle. The express charges will gladly be paid by these gentlemen.**

## Tri-State Dental Meeting.

**There will be a joint meeting of the State Dental Societies of Michigan, Ohio and Indiana held in Detroit June 18, 19 and 20. A cordial invitation is extended to the profession.**

**J. W. HOUSE, Secretary.**
**Grand Rapids, Mich.**

## Illinois State Dental Society.

**The thirty-first annual meeting of the Illinois State Dental Society will be held at Galesburg, May 14 to 17, inclusive. An interesting programme is in course of preparation. A cordial invitation is extended to the profession in**

**general. This will be the first meeting in Galesburg since 1876, and it is the hope of the officers that it will be one of the most profitable meetings in the history of the society.**

**LOUIS OTTOFY, Secretary,**
**Masonic Temple, Chicago.**

## SUPREME COURT DECISION.

A decision by the supreme court of this State of a point which arose in the application for a new trial in a recent criminal case, defines the legal standing of the dentist in relation to his patients, and is as follows:

"A dentist is one whose profession is to clean and extract teeth, repair them when diseased, and replace them, when necessary, by artificial ones. The act which renders the relations of physician and patient privileged only contemplates a general practitioner. A dentist is not a surgeon, and his business is not interchangeable with that of a physician and surgeon. Therefore there was no error in admitting the dentist's testimony against the prisoner."

The only other case in the United States bearing upon this question was decided by the supreme court of Missouri. There are seven judges in the Missouri court, four of whom decided that a dentist is neither a physician or surgeon, and three maintained that he is. The Missouri court said, in its decision, that a dentist is no more of a physician and surgeon than a corn doctor is. The Michigan supreme court, in deciding the case, cites the Missouri case as an authority.

Prof. Otto Kirchner, of the Law Department, in commenting upon this decision, says:

"I am surprised that our supreme court should take such a position. The statute which makes communications between physician and patient privileged is really in the interest of public health. It says to all sufferers that they may consult a physician without fear of having their bodily infirmities exposed to public view. One reason of the statutory rule, it seems to me, is as applicable to the case of a dentist as to the general practitioner. The academic standard and requirement for a dentist's degree is, with few exceptions, as high as for the degree of medicine. I do not see, however, that that should be decisive. If I should consult a corn doctor for treament, there seems to me no reason why my communication to him should not be as sacred as if I had consulted a doctor of medicine for a cold."

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## MISCELLANEOUS.

It is claimed by Dr. W. H. Atkinson that the best disinfectant is produced from a grain of bichloride of mercury in one ounce of peroxide of hydrogen.

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Dr. B. O. Stevens believes that the spirits of gum camphor will remove all irritating and caustic effects of carbolic acid. Apply strong on cotton, or, if the burn be large, apply a paste made of the gum moistened with alcohol.

* * *

We feel like doffing our hat to the person who told us to soap the holes in the rubber-dam before placing it over crowded teeth.

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Often cases are met which result in severe and obstinate hemorrhage from the slightest wound. In such instances Dr. Watling uses, besides compresses, a systemic remedy, which is as follows:

℞ Pulverized opium------------------grs. IV
Acetate of lead--------------------- " XXIV
Sig.—Make into eight powders.
One to be given every two hours until hemorrhage is controlled.

* * *

In cleaning teeth mix your pumice with a solution of castile soap, instead of pure water. It cleans easier, leaving a smooth finish.

* * *

In taking plaster impressions for partial plates difficuly is often experienced in having the plaster adhere to the teeth. The adhesion is due to the great affinity of the plaster for water, and unless that affinity is perfectly satisfied in the adding of water to the plaster in making the mixture, it will absorb every bit of the lustre from the teeth, and then cause adhesion. To obviate this difficulty, slightly oil the teeth before taking the impression. The oil allows the hardened plaster to slip from the teeth easily and smoothly, thus preventing many failures.

Dr. Carrow, of the University hospital, at a meeting of the Dental Society held on April 1st, favored those present with a talk on cocaine and general anæsthetics, reciting many interesting experiences with those drugs. The doctor's method of administering chloroform is somewhat different from that pursued by a majority of the profession. He prefers pressing the cone down tightly over the face, allowing air only to pass through the cone mixed with the vapor of the drug. He reasons that the vapor, being less diluted with air, surprises the tissues and brings the patient very rapidly under its effects with less quantity of the drug, and that the patient more readily recovers from the anæsthetic. His method in using cocaine is to inject into the superficial tissues, at various points to be operated upon. The needle merely passes through the skin, injecting a drop or two, which produces the appearance of a blister.

The following formula is used hypodermically by him:

| | | |
|---|---|---|
| ℞ | Hydrochlorate of cocaine | gr. j |
| | Chloride of sodium | " j |
| | Bicarbonate of sodium | " j |
| | Distilled water | ℥ j |

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## ALUMNI NOTES.

Wm. B. Elster, D. D. S., '94, of Flushing, Mich., favored the college with a visit in March.

A letter from Dr. A. C. V. Gilmore, '94, says that he is permanently established at his home, Holland, Mich.

Dr. M. G. Hillman, '93, and Miss Ina Walker, both of Greenville, Mich., were married May 1. Congratulations of the Journal.

Dr. M. R. Stimson, '93, who has been practicing at Brinkley, Ark., is spending a few weeks at the home of his parents in this city.

Dr. A. W. Diack, '92, lecturer on Dental Materia Medica in the dental department of the Detroit College of Medicine, has lately paid several visits to Ann Arbor.

During the latter part of April Dr. A. W. Weible, '94, left Detroit for Jamestown, N. Y., where he will practice dentistry. Before leaving he called on friends in this city.

Dr. DeWitt Spalsbury, formerly located at Three Rivers, Mich., has succeeded Dr. Van Fossen, of Ypsilanti, Dr. Van Fossen's health compelling him to retire from practice.

A card announces that on January 8th, Dr. Manuel V. del Valle, class of '91, now at San Juan, Porto Rico, was married to Maria B. Hernandez. The JOURNAL extends best wishes.

Dr. Fred M. Prettyman, '93, who has been acting as assistant to a Brazilian dentist for the past year, is now established in an office of his own at Campina, Brazil. Success to him.

Friends of Thos. H. Low will be pleased to learn that he received the degree of D. D. S. from the Baltimore College of Dental Surgery on March 29th. The JOURNAL extends congratulations.

Dr. E. L. Gedney and Dr. Anna K. Miller, both of '94, were married in this city on March 5th, and left immediately for Winnebago City, Minn., which will be their future home. Best wishes of the JOURNAL.

Dr. T. B. Mercer, '93, of Wausau, Wis., sailed in March, 1894, for South America. The following December, owing to an attack of yellow fever, he was compelled to leave that country, and has since been travelling in Europe. His arrival home is daily expected.

A recent letter from Dr. A. V. Elliott, '81, of Florence, Italy, tells of the welcome the JOURNAL receives upon its arrival and of the high esteem in which it is held. It is with pleasure the Board of Editors learn from that distant land that their efforts are appreciated.

Dr. Geo. E. Tribby, '92, the first Assistant Business Manager of the JOURNAL, was married to Miss Clara Bowen, of Chardon, Ohio, on April 2d. Dr. Tribby is located at Mentor, Ohio, and makes periodical trips to Willoughby, where he conducts a branch office. The JOURNAL extends its congratulations.

Dr. Geo. B. Hayes, of Tacoma, Washington, class of '89, has been called to accept an interest in the practice of Dr. A. H. Sylvester, of Berlin, Germany. As the Royal family and many members of the Reichstag seek the professional services of Dr. Sylvester, the call to Dr. Hayes is considered a flattering one from a financial as well as professional point of view.

Dr. C. D. Cassidy, '94, is at Dublin, Ireland, preparing for an examination before the Dental Licensing Body of the Royal College of Surgeons of Dublin. Should Dr. Cassidy pass the examination he will be privileged to practice dentistry in any part of the British Dominion.

Mr. S. P. Budgett, who has for three years been assistant to the Professor of Physiology, and who graduates with the class of '95 of the medical department, has been offered the position of Professor of Physiology and Histology in the Medical Department of Washington University, at St. Louis, Mo., with a salary of $1,800 per year. Mr. Budgett is now traveling in Europe and will no doubt accept the position.

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## Report of the Dental Clinic for '93 and '94.

The following will give an idea of the amount of work done last year by the students in the operating room, the figures for the work done in prosthetic dentistry not being available at this time, but which are, in comparison, quite as large, proving that the College has plenty of clinical material and that no student need leave its doors without having acquired knowledge by practical experience:

| | | | |
|---|---|---|---|
| Bridges | 6 | Fillings (plastic) | 1,321 |
| Logan crowns | 65 | Treatments | 3,367 |
| Richmond crowns | 63 | Extractions | 960 |
| Downie crowns | 3 | Cleanings | 582 |
| Aluminum crowns | 4 | No. of patients | 8,694 |
| Fillings (gold) | 5,965 | No. of operations | 12,336 |

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## DEPARTMENT NOTES.

Crimson and gray are the colors of the class of '97.

On March 25th Dr. Watling began marking the Seniors upon their gold fillings.

At the close of college Fred P. Graves, '95, will enter his father's office, Battle Creek, Mich.

W. H. Buttolph, '96, has been absent a few days from college nursing an affection of the eyelid.

Mr. C. A. Phillips, '96, who was called home in March on account of the serious illness of his father, returned last week.

Mr. J. W. Lyons, '96, is at Mt. Pleasant, Mich., assisting the county school examining board, of which he is a member.

Many of the Dental students have forsaken the "Whisker Club." Their clean shaven faces once more assume a boyish appearance.

J. B. Dowdigan, '95, was elected delegate to represent the department in the annual election of officers of the Students' Lecture Association.

Mr. W. D. Bruce, of New Zealand, a member of the Freshman class, has been obliged on account of ill-health, to relinquish a part of the second semester's work.

The Junior class has completed Black's Dental Anatomy, and are now busily engaged with Dr. Weeks' Operative Technics, a new study introduced into college this year.

Messrs. Neeley and McLaughlin have formed a partnership, and will practice dentistry in Marion, O., where they have engaged a suite of rooms in a new building. We wish them every success.

The Freshmen have finished the plate work under the demonstrations of Dr. Hoff. They are now trying to keep pace with Dr. Haidle, while he is unfolding the mysteries of crowns and bridges.

Messrs. Ball and Smith have joined hands and will establish themselves at Detroit, Mich., where arrangements have been made to open an office early in July next. May success attend their efforts.

A new outside iron stairway has been built on each side of the main entrance to University Hall. It provides a needed exit since the closing of the inside stairway leading from the stage necessitated by the placement of the new pipe organ.

Dr. Custer, of Dayton, O., gave an interesting demonstration last week with his electrical furnace. Owing to the absence of electricity in our building the demonstration was given in the physical laboratory. The furnace worked perfectly and baked the continuous gum plate in a short time. All were satisfied of its completeness and many praises were heard of this novel piece of mechanism.

Mr. Harry B. Hinman, '95, has been on an investigating tour in Ohio, for the purpose of selecting a suitable place in which to practice his profession. He will practice at Bucyrus, Ohio. We congratulate Mr. Hinman in so early securing a good location.

Mr. W. R. Purmort has the congratulations of the Dental Department, especially of the class of '97, having won the feather-weight championship in the boxing contest with Mr. L. Hubbard, A. B., of the literary department, at the indoor meet of the U. of M.

A few of our subscribers have neglected to deliver into our possession their quota of the necessary. We suggest that now is a most convenient time to pay the same, and it would be a convenience to us if delinquents would interview our business manager on this subject.

All department subscribers to the JOURNAL whose address cannot be obtained from the catalogue are requested to give the same to the business manager that each may receive his or her July number of the JOURNAL. That number will not be published until the students have left for the summer vacation.

For some weeks past Miss Hubbard has been cataloguing and systematically arranging the books in the dental library. Heretofore there was no definite order or classification of the various works on dentistry, and the present method is one to be appreciated. Much credit is due our librarian for bringing order out of chaos.

At the first meeting of the Dental Society for this semester the following officers were elected: President, Ralph L. Williams, '96; vice-president, C. A. Phillips, '96; secretary, Miss Dessie Robertson, '97; treasurer, S. S. Mummery, '96. A paper was read by Mr. H. B. Hinman, on "Replantation of Teeth," which will be found in this issue of THE JOURNAL.

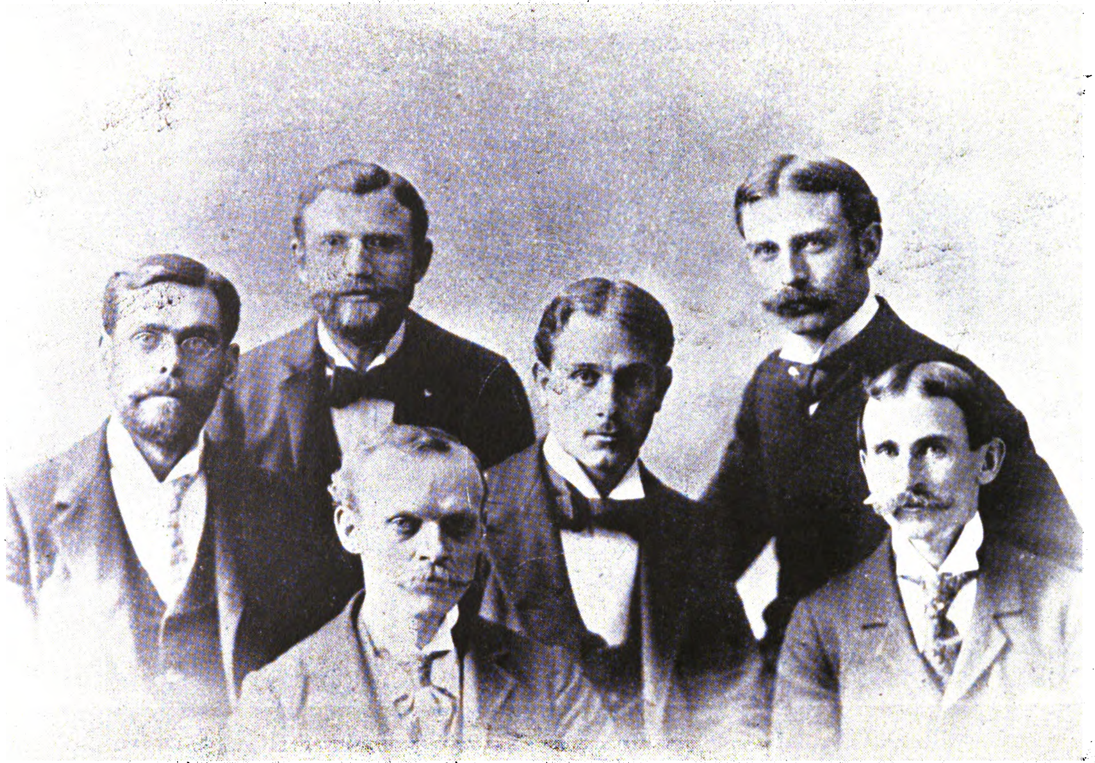
Dr. W. H. Jackson has enriched the Dental Library by bestowing upon it all of his large collection of unbound dental journals. In this accumulation of dental literature is a complete file of *Johnson's Dental Miscellany*, a publication that was born in 1873, going out of existence in 1881, and of which the College had only four numbers. The collection includes many other valuable journals and numbers several hundred. Other friends and alumni of the College could advance the usefulness of the department in no better way than by increasing the amount of literature at the disposal of the students.

At a meeting of the Dental Society, held March 15th, an interesting demonstration was given by Dr. Hoff in casting aluminum. Resolutions were also adopted changing the meeting night of the society from Friday to Monday. The chairman of the executive committee was instructed to correspond with Dr. Downie, of Detroit, and Dr. Custer, of Dayton, O., with the view of having them demonstrate the use of their different porcelain furnaces before the society. Mr. Mummery made his report as treasurer for last semester, showing that a balance of $54.60 was on hand.

March last the '94 class picture was hung on the south wall of the waiting room. The workmanship is considered to be as fine as any yet adorning the walls of the college. The delay in not having the picture ready before the close of last year was due to the delinquency of several members of the class in furnishing their photos. Whether this same history is to be repeated with the class of '95 depends materially upon the activity of the present picture committee. It is the wish of many to have the class picture completed before the close of the college year.

According to custom the members of the State Legislature made their bi-annual visit to the University in March. Their brief stay here was attended with many courtesies extended by members of the Faculties and by citizens, who entertained the distinguished guests in a royal manner. In the evening, the members, their wives, daughters, and a legion of pages, were escorted from a bounteous lunch served at Granger's Academy, to University Hall, where a musical entertainment was given in their honor, by the Choral Union, and by the Glee, Banjo and Mandolin clubs. The following day was spent in visiting the various departments, a good share of attention being given to the Waterman Gym.

Mr. Herman Prinz sailed for Europe April 15th, in response to a call from the Faculty of the University at Halle, A. S., Germany. It is with not a little pride to the dental department that it had just the right man for the place, and none the less to the Junior class that one of their number had become so proficient and well qualified in the profession as to be able to fill the position of demonstrator of mechanical dentistry in the Fatherland. The work will embrace more particularly the latest and most practical methods and ideas relative to crowns and bridges and regulating appliances. While we predict for Mr. Prinz every success, we hope he may not be so fully occupied with his work that he cannot return to graduate with the class of '96.



C. H. Bailey, '96. H. Prinz, '96. J. W. Miner, '97. L. E. Coonradt, '95. O. M. Barton, '95. A. W. Haidle, D. D. S., '92.

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# EVOLUTION AS ILLUSTRATED BY DENTITION.

*BY HOMER F. HUSSEY, D. D. S., RICHMOND, IND.

In the words of another, "The proper study of mankind is man." But the individual is so a part and product of nature, that a thorough understanding of man in all his relations, is impossible without a comprehension of his environment. Any one with even a slight desire for knowledge, must be enthralled by the constant relations of nature. A little study necessarily brings with it the question, "How did these things I see around me, come to be." The origin of life is explainable in one of two ways. Different species must have existed as they now are, by special creations, or, life has been a constant development, an evolution. Various forms have appeared on the earth at widely different times. So if the first hypothesis be true, there must have been innumerable acts of creation. But in that case, all the common characteristics animals possess, are deceptive, and inevitably lead us into gross error, "We cannot believe, however, that a careful study of the facts of nature leads to conclusions directly opposed to the truth." And as we seek in vain, in physical structures, for an indication of the origin of any species independent of the rest of the animal world, "We are compelled to reject the idea of special creations, as being entirely unsupported by investigation, as well as in the highest degree improbable. No theory of life and nature has ever had so firm a foundation of facts; no theory has been so far-reaching in its scope, nor has so easily and sensibly explained the origin and development of matter, as that of Evolution. By it, allowing a

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*Read before the Richmond Dental Society.

Divine force, a Creator of matter and of Spirit, the long line of development of the animal and vegetable kingdoms, is rendered intelligible; by it we can more nearly comprehend the great plan of creation, and as we trace life from step to step "rethink the thoughts of the Divine Thinker."

Evolution is nothing more or less than the manner in which the Supernatural is expressed in the natural, by means of law. It does not account for the origin of matter, but, finding created substance, sees in it the power of development, and traces life and history from the simplest Protozoa to the most complex organism.

Necessity in a great measure determines the development of organs. It is an unaccountable fact that organs which would be useful to an animal, are developed, and that until that time, they are not present. Predetermined transformation plays a heavy role in the animal ecomony, and is responsible for the appearance of a certain tissue or organ at the needed time. So, few evidences of real teeth are found in the lower animals. It is not until we reach the vertebrata that teeth are present, either as a means of locomotion, offense or defense, construction or mastication.

Prof. Owen says: "The higher an animal is placed in the scale of organization, the more distinct and characteristic are not only the various organs of the body, but the different tissues which enter into their composition. And this law is exemplified in the teeth."

Simplicity of structure denotes a low position in the animal scale, while complexity of organic structure and arrangement is found only in higher animals. This law is typified in the dentition of the various classes of Vertebrata, Mammals, Birds, Reptiles, Amphibia and Fishes, by the number form, situation, attachment, structure and development of the teeth.

Of the first appearance of teeth, Dr. Thompson says: "We claim that the teeth were produced originally as mere dermal structures for the protection of the skin of the jaw against the friction of food in mastication, and were subsequently developed as organs of various forms in different species." But the "immutability of species" is established beyond successful contradiction, so a variation and gradation of tooth structure would seem to be the consequent order of things in successive higher forms, as is actually the case. The power of adaptation is exemplified in tissue even so resistent of change as dentine and enamel, and furnishes a beautiful example of that coördination of means to end, so universal in nature.

A consideration of the teeth of vertebrates, as to their (1) number, (2) form, (3) situation, (4) attachment, (5) structure, and (6) development, may serve to show something of the graded series of tissues which have existed in the various animal forms, the result of a law of growth according to evolution.

I. The *number* of teeth found in the same species is quite variable. Among Fishes, the lowest order of vertebrates, almost any number may be present, from one to thousands. Here again is demonstrated the law that simplicity of structure is coincident with multiplicity of organs. As the higher forms of Fishes more nearly approach the order of Batrachia, the number of teeth decreases. The same is true of the orders of Batrachia, Reptiles, Birds and Mammals, the teeth becoming constantly less in number, from the lower to the higher order, and changing from teeth which might develop in any number and at almost any time, to a definite number erupted at certain intervals of growth, and distinguished in Mammalia by heterodont dentition.

II. Teeth are modified in *form* as well as number, only according to requirement, and forsake the primitive type as the number is diminished. From the cone-shaped tooth of the fish through succeeding higher forms to Mammalia, "An increasing purpose runs," giving to the animal that peculiar form best adapted to its mode of life and means of sustenance. Cuvier thought the teeth the most decisive and characteristic sign of the animal, "because of the shape, so apt for cutting, tearing and grinding," and so appropriate to the needed diet.

As the type of the animal develops, the tooth-form is varied. Among Amphibia, which seems to be "a link" between Reptiles and Fishes, the teeth are in a transitory state between the conditions found in the two orders named. Not only the form of the crown, but also of the root, typifies the developed state of the animal, and is prophetic of the form and condition of teeth found in Mammalia. And in man, the highest type of Mammalian life, they are subordinated to speech, and are developed with a uniform length of crown, and in a continuous row.

III. The *situation* of teeth is as varied in the different classes of animals as their number and form. Among Fishes, they may be attached to the maxillæ, palate, mandible, or any bone about the head. Among Batrachia and Reptiles, the location becomes more restricted, each species being more liable to have a particular place of attachment. Until in the higher animals, the teeth are situated only in the maxillæ.

IV. Of the *attachment* of the teeth, Janet says: "The mode of their insertion and the solidity of their base, so agreeable to the laws of mechanics, and so well proportioned to their use," is one of the most pleasing mechanisms found in the animal economy.

Teeth are attached in one of three ways: (1) by means of a fibrous membrane, (2) by a bony union, or anchylosis, or (3) by implantation in a socket. All three methods are illustrated in some species of Fish. To quote Chas. S. Tomes: "In the case of Fishes, a transition from the attachment by anchylosis, pure and simple, to that by implantation is to be found." So the evolutionary stages are exemplified in this one class, as well as in the whole order of Vertebrates. But Mammalion teeth are attached only by implantation, the roots being surrounded by a periodontal membrane, with a nervous and vascular supply.

The simpler mode of attachment is found in animals of low degree, where the teeth are not permanently held in position, while among animals which retain the teeth for the greater part of life, the more complex arrangement prevails. In the case of anchylosis, the "bone of attachment" shows a gradual transition from dentine to bone.

V. The *structure* of teeth is as typical of their evolution as any one thing. In the earlier forms of the animal kingdom, dentine occurs before enamel or cement. As Dr. Thompson says: "Where enamel does not appear, it is plain that the dental structure partakes of the general degradation of the organization." Even after the appearance of enamel and cement, their amount and distribution indicate in no uncertain way, the relative position of the animal. In cases where dentine alone is found, it must assume the functions of the missing structures. But in so doing, its usefulness is not impaired, nor does the animal suffer for the absence of the other tissues. For if anything other than dentine were needed, it would be developed.

The component parts of a tooth differ in structure and derivation. Dentine and cement are derived from the endo-skeleton, and are found in animals of lower development. But enamel, not of an osseous nature, is derived from the exo-skeleton. It is elaborated under the increasing demands of higher forms, and at the time of development of more complex structures.

As the organs of higher animals become more numerous and more intricate in their mutual relations, the teeth assume a correspondingly high order of development. The form and structure are in a measure dependent, the one changing as does the other. From a tooth of simple form, and composed of but one element, intermediate structures are found, becoming more and more complex, until all three substances are happily blended in the highest form of Mammalian tooth. But even this is not perfect. Nor is any part of animal structure. The fact that change is the order of nature is one of the greatest benefits. Otherwise, the higher forms of development would have been impossible. And from this fact we may reasonably conclude that man has not yet reached his highest state; but that beyond may be heights as superior to his present development, as that is to the condition of the animals beneath him. The limit is unknowable.

VI. The embryonic *development* of tooth forms does not show such marked differences as some other characteristics. The embryos themselves are in so many respects similar, that distinctions in as small tissues as the teeth, are difficult of discernment. But in a measure the future history of the tooth may be prophesied, telling more or less certainly the relative position of the animal in the scale of life.

No fact of science is better established than that "The history of the individual is the history of the race." This is true as applied to the animal as a whole, and furnishes one of the strongest evidences of evolution. But it is equally true as applied to the development of a Mammalian tooth. At first the simplicity of structure resembles the normal tooth of the Fish, then of the Batrachia, and so of the Reptile and Mammal.

The illustrations of evolutionary growth found in embryonic study, are numerous. The whale is a good example, different species being related in their dentition, to various other animals. In the embryonic state the teeth pass through a transitory condition, functionless and abortive, yet it typifies normal dentition in the higher Mammalia.

Although teeth are not present in Birds, a study of fossil remains gives additional evidence to the theory of evolution. In number they were intermediate between those of Reptiles and Mammals. In form they resemble more the teeth of Reptiles, though were of a higher development. Their situation was more restricted than in Reptiles, and they were attached both by anchylosis and by implantation. Their structure was more complicated than in the case of Reptiles. While enamel is often present in animals of this order, the amount found in the teeth of Birds is greater, indicating a higher position in the animal scale. The variety is more numerous than in Mammalia, although not so much so as in the case of Reptiles. The development is much the same as in the lower order, but removal is less frequent. Hence we find that the dentition of extinct birds is just as we shall expect if evolution be a true hypothesis. The series is complete between all Vertebrates. An occasional link may be missing, but the spirit of the law, if not the letter, is always manifest.

Among the lower animals, the premaxillary bones are distinct, but in man they are united into a solid structure. However, disunion is apparent in the foetus, a thing which would be useless and hence contrary to nature, were it not that it is an evidence of the primordial growth of animals, and man's relation to lower organisms.

Irregularities in the development of teeth, such as the eruption of supernumeraries, the suppression of the third incisor in man, and often of the third molar, are incontrovertible evidences of evolution. For when irregularities or monstrosities appear among animals, they represent in some respect an animal lower down in the scale of structural anatomy. Dentition in idiocy and insanity, abnormal as it is in man, is strikingly similar to the dentition of quadrumana. Of this class of animals, the monkeys of the old world have the same formula of dentition as man. And to carry still farther the apparent evidence of dependent development and evolution, the imperfect arch of some inferior races resembles that of animals approaching man.

About the comparison of the skeletons of the chimpanzee and man, Prof. Owen says: "I cannot shut my eyes to the significance of that all-pervading similitude of structure—every tooth, every bone, strictly homologous—which makes the determination of the difference, the anatomist's difficulty." Innumerable similarities of structure in different species would seem curious and inconsistent if there were no real systemic connection. But the facts are just what we should expect if one form has been produced by descent with modification, from another.

If the conclusions of consciousness and reason are reliable, we may believe that things are in themselves, as they appear to be in the light of scientific research. If the products of creation exist *as if* they were developed by a process of evolution, it is rational to believe that evolution has been and is, *the* mode and the *only* mode of growth of life on earth.

Heresy is not a condition of belief in evolution. Rather, a broader view of the universe and of the "brotherhood of man" is a necessary result. To the evolutionist, on the earth law is supreme. But above law, as Carlysle says: "All seems to point beyond matter into the region of mind, beyond mechanical sequence to purpose, beyond nature to God." For the origin of all that mystifies and yet inspires us, we can only find an adequate cause in the unseen universe of Spirit.

## CONSERVATIVE TREATMENT OF THE DENTAL PULP.

*ALBERT L. LE GRO, '95.

The intimate connection existing between the pulp and the tooth structure itself, the dependence of the healthy condition of the tooth structure and the usefulness of the whole organ upon the preservation of the pulp in its natural state, are sufficient reasons for us to look favorably upon the practice of conservative dentistry. With these facts in mind one cannot conscientiously devitalize a pulp until all efforts to save it have failed.

A great many operators, even at the present time, make no distinction in respect to the treatment between a tooth affected with a mild form of Pulpitis and one with purulent or even gangrenous pulp, but go on with their own favorite method of devitalizing without the careful diagnosis which it is his duty to perform and which might be instrumental in retaining the vitality of the organ.

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*Read before the Dental Society May, 24th, 1895.

While it is true that a purulent or gangrenous pulp should be removed, and the sooner the better, it does not follow that a mild case of Pulpitis should necessitate the loss of that organ.

A patient may have such predisposing causes of caries as poorly developed, porous teeth, with large interglobular spaces, deep fissures and blind holes in molars and incisors, or poorly developed enamel. Knowing that it is only a matter of time when a general breaking down of tooth structure will commence, we advise her to seek consultation, say once every six months. Through fear of the dental chair or from pure negligence she waits, during which time the little germ* does it work and she confronts us with a tooth containing an irritated exposed pulp. Nothing but success and a speedy and painless operation is looked for by the patient, and of course we must be equal to the occasion. Right here a careful diagnosis with good judgment comes into line and it remains for us to determine whether the tooth is to retain its pulp or to depend in the future for its nutrition upon the enveloping membrane. Here we must be either radical or conservative. One might say, if he should happen to advise devitalization, that to be radical would be conservative in this case. Not if it is possible to save the pulp by treatment and capping. If this is impossible and destruction of the pulp must be resorted to, devitalization is then conservative.

Some say that radical treatment is easier, less troublesome, requires less knowledge and out of so many cases no bad results have come, then why do we recommend the practice of conservative pulp treatment so strongly?

The dental pulp was protected by Nature, the same as all other vital parts and organs of the body, free from danger. The longevity of the pulp and the amount of endurance that it possesses even when the most severe diseased conditions are upon it, and the disastrous results of its loss, (a remedy, for which, we have not yet found), all direct us to the conclusion that Nature intended it to stay in the tooth throughout life.

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*We have had the inflammation, the worm, the putrefaction, the chemical, the electrical as well as the parisitic theories of decay and as Prof. Sudduth says, " Dr. Miller's theory of the formation of cavities by the action of a digestive ferment upon the basis substance of dentine, has been the only theory ever advanced that explains the formation of cavities."

Having decided to practice conservative pulp treatment whenever advisable, the next consideration is that of prognosis and treatment. There is a vast difference as regards prognosis, whether the diseased pulp occurs in a robust and healthy or in a weak and anaemic subject. Therefore prognosis should be very careful in "subjects of depraved constitution in whom every wound, however insignificant, takes on suppurative action." Extreme conservatism which has been practiced by a great many operators during the past few years has caused them to put scarcely any stress at all upon the condition of the patient.

Attempting to treat and cap all conditions of diseased and exposed pulps should not be encouraged. Such pathological conditions as congestion or strangulation of the pulp should not be treated conservatively.

In acute inflammation of the pulp, the chances are not always favorable for success either, but with care and perseverance, a large number of teeth that would otherwise succumb to the indiscriminate judgment of purely "radical treatment" operators, might be cured and made useful for a number of years at least.

We cannot always attain the success that we so much desire. We must expect failures and will occasionally have bad abscesses, acute inflammation, suppurative pulps, etc., to deal with subsequent to conservative treatment. Different operators obtain opposite results with one and the same method, so we must not be too confident with some other operator's successful method but "prove that which is good, and hold fast to it."

The first attempts at pulp capping were made by cauterizing the exposed surface of the pulp. The resulting broken down tissue was left there to serve as a barrier between the pulp and filling. This operation dates back prior to the general practice of pulp devitalization and its failure has probably done more to cause the wholesale use of arsenic than anything else.

Prior to 1875, oxychloride of zinc "the great American invention," as theEnglish called it, was the universal nerve cap material, highly recommended by the majority of "conservative treatment" advocates, but it is safe to say that by its great irritating and escharotic effects more nerves have been devitalized than through any other cause. If we wish to be conservative in practice we must cease the indiscriminate treatment of pulps by such escharotics as oxychloride of zinc, impure creosote, etc., and find some substance, the application of which to the organ, will not deteriorate any part of its structure or irritate it in any way.

After these unsuccessful attemps at pulp capping came the radical treatment craze, when arsenic occupied the throne of supposed utility in dentistry. The number of pulps devitalized by this drug could not be estimated, but we are glad to know that its careless use does not predominate to-day as it did a few years ago.

To treat the diseased or afflicted tooth we must remove and exclude all irritants from the cavity, getting free access to the pulp and leaving no sharp edges to irritate its surface.

Rounded instruments should be used in this part of the operation as angular cutting edges are liable to cause undue exposure. Large excavators are preferable as a small instrument would, if carelessly handled, be likely to wound the surface of the pulp. In removing the decay, care should be taken to excavate towards the orifice of the cavity and when all of the carious matter around the immediate vicinity of the pulp has been removed, that part remaining over the pulp can be taken off by means of a thin round excavator, thus avoiding the liability of wounding that organ.

If the pulp is found inflamed use what sedatives and astringents you have been most successful with, or if suppurating, give the proper disinfecting treatment. If the patient is healthy and robust Nature will not need much medicine to help her out of the difficulty, providing all irritants are removed.

In treating suppurative cases, some disinfectant must be used that will coagulate albumen,otherwise it will tend to absorb all moisture of the pulp and consequently lessen its chances for recovery. There are a great many to select from but great care should be taken and none but pure drugs used.

Having brought the pulp back to a healthy condition we must now find a capping that is non-irritating, a non-conductor, and one that can be accurately adapted to point of exposure and hermetically seal the orifice to the pulp.

Oxide of zinc seems to be the substance, par excellence so far, as a basis material for this capping. It has been found to be inert in combination with certain drugs that are used successfully in treatment of diseased pulps. Oxide of zinc may be "prepared by simple combustion of metallic zinc with the proper arrangements for collecting the sublimed powder thus formed. Extreme whiteness is a sign of impurity, the official oxide being of *yellowish* white."

Having obtained the basis substance, we must find some drug or drugs which when incorporated with it will make a non-irritating capping and which will resemble dentine as near as possible.

Pure wood creosote has been found by the majority of conservative dentists to be the drug most desired in this operation. Zinc oxide in combined relation with creosote is inert and the pulp seems to tolerate its presence and contact without raising any disturbance. In this position the zinc oxide acts as a retaining body, holding the creosote in actual contact with the pulp and giving it off very slowly that its curative and preventative properties may be properly exercised. This capping is antiseptic to a certain extent, it remains unchanged within the space and in time becomes quite firm. Pure creosote is mild in action and is slowly given up by the oxide of zinc.

A great many operators have failed when using creosote simply because they did not get the pure article. Many preparations of creosote on the market are a compound of impure phenol, creosol and other aromatic alcohols, which exert a powerful escharotic effect on all soft tissues, therefore care and discrimination should be exercsied in ordering this drug.

The capping material should be mixed to a creamy consistency and may be applied to the expoxed surface in concave discs made of tin, gold, platinum, vulcanite, or anything that is most convenient to the operator.

All pressure should be avoided but the material must be put in with a firm hand and a perfect adaptation to the exposed surface secured, for if a pulp happens to die under a capping that does not conform to the shape of the exposure, serum and later pus exude with no point of escape. The absence of lymphatics in the pulp makes the process of healing a difficult one and with the irritation of a non-fitting cap, a consequent formation of waste products eventually extends to the apical foramen and results in an agonizing and acute abscess.

After a successful capping a temporary filling should follow, to remain until the control period has passed, which is generally two or three weeks, when part of it may be removed and a more permanent filling inserted.

Prof. Hoff, if doubtful of success after capping a pulp, sends the patient home with a vial of the following, to apply whenever a sense of fullness or pain is experienced.

℞ Chloroform---------------------------℥ IV
Tinct. of Iodine-------------------gtt, XX
Menthol -----------------------------gr. X

M. Signa.—Dry the gums around the tooth treated, with towel or napkin, and apply remedy with camel's hair brush or pledget of cotton.

This will tend to keep irritation away from the pulp itself and will probably prevent the formation of gases in the chamber.

Where the tooth has been impressed by cold, before or after treatment, a *very careful* application of tincture of aconitum root two parts, and chloroform one part, has been recommended by Dr. Louis Jack.

Numerous other successful methods of pulp-capping have been given, a few of which I might name.

Gelatinized phospho-carbonate of lime used after a previous expulsion of air by application of glycerine, has its advocates. It hardens quickly and is not irritating.

Balsam of fir on note paper has been successfully used by some after bringing the pulp back to its normal condition.

Dr. Wahlkoff recommends the application of ter-chloride of phenol, repeated every third or fourth day, until the patient experiences no pain and the pulp regains its normal appearance.

He then advises ter-chloride of phenol incorporated in iodoform cartilage as a substance for the cap, followed by a temporary filling. Wahlkoff reports only one failure in twenty cases of Pulpitis treated in this manner.

With success in the face of so many bad predictions of "pulp extirpating" operators, we cannot but admire the courage and zeal of conservative advocates who are practical as well as theoretical.

# TRANSPLANTATION AND IMPLANTATION.

*C. L. THUERER, '95.

Colyer defines transplantation as being the operation of transferring a tooth from its own socket to that of another tooth.

The transference may take place in the same mouth or the tooth may be extracted from the mouth of one person and transferred to that of another.

He defines implantation as an operation consisting in the formation of an artificial socket in the maxillary bone for the introduction of a natural tooth.

Neither transplantation or implantation are considered as successful as replantation. Transplantation of teeth has been practiced for several centuries but not scientifically until the latter part of the 19th century. There is little question that the practice was known to the ancients and there is reason to believe that both the Israelites and ancient Egyptians performed the operation.

Natural teeth fastened in by gold wires have been found among the mummies.

In transplantation we include the subject of implantation. John Hunter, late in the 18th century, 1783–1788 practiced transplantation and replantation and is credited with the introduction of the subject of tooth transplantation.

Dr. Younger is probably doing more at present than any other one man in the practice of transplantation and implantation, his operations being accompanied with apparently good success. Hunter, who introduced and recommended the practice of implantation found the operation quite difficult, uncertain and often unsuccessful. In the practice of transplantation many disagreeable and alarming symptoms are attendant in some of the cases, while in many no trouble is manifested. In some of Hunter's latest works he endeavored to diminish the disrepute into which a practice had fallen to which he was naturally partial, by accounting for all symptoms which occurred on the principal of irritation exciting deranged sympathies.

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*Read before the Dental Society, May 24th, 1895.

It may readily be conceived that irritation of a foreign body as the tooth of one person being introduced into the alveolus of another will occasion many extraordinary sympathies independent of any infection. As a result of the many failures in transplantation the practice was abandoned for many years, but since 1850 it has been renewed and is gaining the confidence of many who at first laughed at the idea of taking a tooth from one person and succeeding in producing a very natural effect by placing it into the vacant space of another mouth.

It is needless to say that antiseptic precautions must be practiced in all cases. The objections to transplantation as classed by Coleman are three in number: first—the liability to failure; second—the chance of inoculation; third—the moral objection.

Failure of the operation may be due to (a) a want of adaptability of the tooth to its new socket; (b) morbid conditions of the new socket; (c) applying ligatures to keep the transplanted tooth in position.

The chances of inoculation are many and very important as there have been cases of syphilis, tetanus and erysipelas recorded as having been due to inoculation in the process of transplanting a tooth. The moral objection is also quite weighty as naturally the teeth to be transplanted are usually obtained from the poorer classes. Smale and Colyer condemn the operation when a tooth is transferred from one person to another and think the only condition where it may be considered justifiable is in a case of irregularity; they also state that implantation is less justifiable then transplantation. Dr. Younger who was the first to implant teeth is very careful in the selection of his patients taking only young and healthy subjects. He does not always use freshly extracted teeth but in many cases uses dry ones. One very strange feature of so called "tooth-planting" is the length of time that a tooth can be out of the mouth and still preserve its vitality as is manifested by the attachment to an alveolus into which it may be transferred. Dr. Thomas of Los Angeles, Cal., formerly of Detroit, in Cosmos of 1878, wrote that the operation had but two obstacles in the way of its perfect practicability: first—the difficulty of obtaining the proper teeth at the proper time; and second—the possibility of inoculation, and the latter he regards as far the more formidable of the two as he does not regard it a necessity that the tooth transplanted should correspond exactly in size and shape to the one extracted. If it is a little too large he carefully reduces it in size, and if a little too small new osseous deposit will supply the deficiency.

As in replanting, preliminary cleansing and filling of pulp cavity and canal of tooth used is a necessity. Dr. Younger uses gutta-percha as a canal filling except at the apex of the root where a combination of gold and tin is preferred, the part being contoured and highly polished. Dr. Ottolengui speaks highly of the use of gutta-percha alone suggesting in the connection a peculiar endurance of the material on the part of the bone. A tooth to be implanted is to be subjected to aseptic treatment to which end a bath is recommended made of mercuric iodide of potassium (1 gr. to $H_2O$ ℥vj and alcohol ℥j), or of the bichloride of mercury (1 to 1000). Dr. Kirk, in his paper on the subject says; "It is to be borne in mind that a body foreign to the tissue is introduced, foreign because devoid of vitality and which may become an irritant of sufficient intensity to defeat the object in view by inducing such a high state of inflammation as to cause suppuration if not sloughing or at least failure to unite, one object is therefore to so control the vascular excitment that it shall not exceed at any time the degree necessary for the repair of the wound and encapsulation of the root."

It is recommended that all burs, drills, reamers, syringes. and sponges used in the operation be placed in a hot solution of hydro-napthol (1 to 300) occupying a basin close at hand, being careful not to use the same instrument the second time without thorough cleansing from all particles of bone and blood and replacing in the hydro-napthol.

To expose the bone, Dr. Kirk employs a simple incision with view to securing adherence of the gum to the neck of the tooth, preceding his manipulation by injection into the seat of operation between the bone and periosteum of $\frac{1}{8}$ gr. of cocaine which proves a very satisfactory pain obtunder. Dr. Younger makes a cross cut in the gum and dissects back the four flaps. Dr. Ottolengui recommends the removal of a section by means of a tubular knife used in the engine, a devise of Dr. Rollins. Many instruments have been devised for use in this connection, such as Ottolengui's combination instrument, Younger's reamers, many trephines and spiral knives. Dr. Curtis uses a "denuder" for removing the periosteum; it is shaped like an ordinary dental chisel curved on the flat side, with keenly sharp surfaces. Teeth are sometimes implanted to act as posts for bridgework and unless the operator exercises good judgment and skill failure would seem inevitable.

Reunion—the first theory is that the pericementum of an implanted tooth becomes revivified, a second assumes the socket to contract about the planted tooth and hold it in place mechanically, the third is that osseous material is deposited about the root of a tooth, the fourth is that true anchylosis occurs. Dr. Sudduth says as regards " the methods of attachment there is no doubt at all but what it is at first one of encapsulation, and following this if the vascular conditions are kept properly controlled, bony anchylosis." The pericemental attachment of the teeth serves as a cushion between the root of the tooth and the bone, which in mastication tends to soften blows; in the case of an implanted tooth we have no such fibrous tissue between, and if it is a case of bony anchylosis where the tooth and the bone come directly in contact, there is a different condition from that of a natural tooth—a condition which can be detected by sound. If you tap with an instrument on an implanted tooth it gives a hard resonant response that is not perceived when a natural tooth in its original condition is struck in the same manner, there being no intervening membrane between the tooth root and the bone and we are to infer that such tooth will be a weaker member than one undisturbed. Dr. Curtis presented a series of illustrated studies (Brooklyn Medical Journal) in which his observations exhibit that fixation in the case of implanted teeth is by true anchylosis. This shows accord with experiences recorded by others and is not without plausibility. Later such new formed bone, together with a root of a tooth, undergoes degenerative changes. Whether transplanted or implanted, we find loss of the tooth almost sure to follow sooner or later as a result of abscess or absorption, and the same is true in many cases of replantation.

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A ten per cent. solution of baro-glycerine in water will sterilize forceps, broaches and cutting instruments, and leave them without unpleasant odor.

## EDITORIAL.

During the early part of the session of the Legislature just closed, a bill was introduced proposing to amend the law regulating the practice of dentistry in this state. Under the provisions of the proposed amendment any one having seven years experience in a dental office would be privileged to practice. Not only the practicing dentists, but the people of the state owe a debt of gratitude to the loyal men who gave their time and devoted their energy to fight the amendment. After a short, though spirited struggle, it was pigeon-holed by the Senate committee who had it in charge and was kept there until after adjournment, thus allowing it to die a natural death. Following is a list of the loyal men who were willing to spend time and money in defeating the measure: Drs. A. T. Metcalf, of Battle Creek; J. Ward House, of Grand Rapids; J. Taft, N. S. Hoff, L. P. Hall, of Ann Arbor; G. L. Field, E. C. Moore, H. H. Jackson, J. Lathrop, Sr., G. S. Shattuck, H. K. Lathrop, A. W. Diack, H. C. Corns, C. H. Oakman, W. C. Herbert, R. D. McBride, of Detroit; W. P. Morgan, J. A. White, W. C. McKinney, of Saginaw, and C. B. Blackmarr, of Jackson. The Journal gratefully acknowledges the services of these men. What seems strange in connection with this proposed amendment is that Wm. R. Edgar, a dentist, of Blissfield, Mich., and a member of the lower House, favored its passage. That a dentist should so far transgress his professional instincts as to favor the passage of a bill degrading the practice of dentistry is almost incomprehensible, and is deserving of the most severe censure.

⁂

Various changes have been made in the curriculum for the past years and always for the raising of the standard of the department. Not only have these changes proved of benefit while in college, but the effect is manifested throughout the world wherever a U. of M. man is to be found. Several years ago Latin was required for admission to the department. It has proved to be the best policy that could have been adopted. An accurate knowledge of the studies pursued, a thorough understanding of the work and a thorough drilling and manipulation of practical work and the student is ready to enter the profession. There will be various changes next year. There is a possibility of a change in the Freshman studies; the prospective Junior class will devote their time to theory, having completed their plate, crown and bridge work in their Freshman year; the Senior class individually will be compelled to keep a record of operations performed, the name of the patient and the work done. It is thought that in this way some of the mistakes made this year will be avoided.

* * *

THE graduates of '95 have started upon their way in the world. Whether all the class will make a success in their chosen profession remains to be seen. They certainly have a bright prospect before them if they are to judge by the men who have preceded them. Among the leading dental colleges of the country are to be found U. of M. men, men who attained to their present position by their untiring efforts. We find all grades of the dentist from the strictly professional to the quack. It is to be sincerely hoped that none of the class of '95 will so degrade the profession as to belong to the latter class.

* * *

Now that the illegal practitioners of dentistry in this state have failed in their efforts to have the present dental law amended to suit their purpose, it will be in order to proceed against them as provided for in Section XII of the Law for the Regulation of the Practice of Dentistry in the State of Michigan. Let the dentists of each town and city see to it that the law is enforced.

* * *

OUR college will be well represented in the old country the coming year. In the Senior class there are seven from across the waters. It is their intention to practice dentistry in their respective countries after three years continuous study in the college. They will undoubtedly help to keep the high standing of the U. of M. up to its present standard among their people.

* * *

PERHAPS Dr. Donald Maclean, of Detroit, will next try to prove that the word "tyrotoxicon" was coined during the days of Moses and that the poison was one of the ten plagues which inflicted Egypt at that period of her history.

WITH this issue of the JOURNAL the present Board of Editors completes its work. The board wishes to thank the professors and students of the department, the profession in general and the Courier Publishing Company for the many courtesies extended. The work has been a pleasant duty. That the gentlemen who will conduct the JOURNAL next year will find it as great a pleasure is the wish of the retiring members of the Board.

⁂

THE *Evening News*, of Detroit, is to be congratulated upon the success of its school for the education of liars and admired for its nerve in imagining that the well-informed people of Michigan will believe any of its Munchausen tales of the anatomical laboratory of the University. The *News*' Ann Arbor correspondent must have taken a *p. g.* course in its private school before he came to this city to write his improbable tales of antics in the dissecting room.

⁂

WE shall miss the Homeops, not for their numbers, but for the peace and good-will which will hover over the campus when that bone of contention has been removed to Detroit.

⁂

The editor with gladsome cry,
  Exclaims, "My work is done."
The manager, with weary sigh,
  Complains, "My work is *dun*."

⁂

WITH this the last number of the JOURNAL is presented a cut of the retiring Board of Editors. It is hoped this will become a permanent feature.

⁂

AT the last meeting of the Board of Regents, held June 26, Dr. J. H. Neeley, of the class of '95, was appointed as Assistant to the Professor of Operative and Clinical Dentistry.

## MISCELLANEOUS.

Spirits of chloroform in the dose of from 20 to 30 drops is recommended by Hare in abdominal pain: it has the advantage over opium, insomuch as it does not constipate.

* * *

Boarder (vainly endeavoring to carve a chicken)—This bird appears to have been inoculated by Prof. Koch.

Mrs. Hashleigh— Pray, what do you mean?

Boarder—It seems to be tolerably secure against consumption.—*Doctors's Factotum.*

* * *

The following antiseptic mouth wash is recommended by Prof. F. G. Novy.

| | | | |
|---|---|---|---|
| ℞ | Saccharine | grams | 2.5 |
| | Benzoic acid | " | 3.0 |
| | Absolute Alcohol | " | 100.0 |
| | Oil of Peppermint | " | 0.5 |
| | Oil of Cinnamon | " | 0.5 |

Sig.—Dilute with nine parts of water and hold in mouth one minute.

* * *

The following antiseptic mouth wash is recommended by Prof. V. C. Vaughan:

| | | | |
|---|---|---|---|
| ℞ | Benzoic Acid | grams | 3 0 |
| | Tincture Eucalyptus | " | 15.0 |
| | Absolute Alcohol | " | 100.0 |
| | Oil of Peppermint | " | 0.75 |

Sig.—Add sufficient of preparation to half wine glass of water until cloudy. Apply with brush.

* * *

To make a good hæmastatic mix four parts of tannic acid to one part of glycerine.

* * *

In superficial caries, cut out the decay and dry thoroughly with chloroform. Then soak the cavity with melted parafine and further decay will be prevented. This method is much superior to nitrate of silver, which blackens the teeth.

* * *

An effectual sterilizing medium is made of lysol ʒ4, water ℥12. Make solution alkaline with common baking soda, or any alkaline substance. Broaches, excavators and other instruments may be left in the solution 2-5 minutes. There is no corrosive action.

For sterilizing instruments Dr. A. W. Harlan favors coarse building sand roasted. A suitable vessel is filled with this, and saturated with a 4 per cent. solution of sublimate, or lysol 50 per cent. It is kept covered with a sterilized piece of pasteboard. The instruments are passed through the sand three or four times, offering a simple, rapid method and absolute sterilization without any injury to instruments.

* * *

In stamping the cusps of shell crowns, use a lump of wax with cotton over it, instead of shot. This gives a better contour to the sides of the crown.

* * *

A good detergent wash for morbid conditions of the oral cavity, pyorrhea, and putrescent pulp canals is composed of,

| | |
|---|---|
| Lysol | ʒ ji |
| Seyler's Antiseptic tablets | No. vi |
| Distilled water | ℥ xiv |

For injections use very hot.

* * *

Dr. Truman gives the profession the following formula for pulp devitalization; arsenous acid ground up with creasote with sufficient glycerine to make a paste; add a few drops of attar-of-roses to overcome the odor of creasote. Will keep indefinitely.

* * *

To finish rubber plates use about one-third emery with pumice. Saves half the labor and time. The palatal surface is covered with oil of glycerine to remove the last traces of plaster.

* * *

Rusty instruments may be cleaned by immersing them for twelve hours in a saturated solution of chloride of tin in distilled water. Rub dry with a chamois after rinsing in running water. They will be of a neat silvery whiteness.

* * *

Arsenic should not be applied as a devitalizer in temporary teeth; the repeated application of carbolic acid, with proper filling, is sufficient.

* * *

Often black rubber plates have a brownish tint when vulcanized. To give a jet black color immerse the plate for a few moments in bisulfide of carbon; then place in water to remove the odor.

Menthol combined with eugenol makes an excellent dressing for an inflamed and aching pulp.

* * *

To remove the green mucous stain on children's teeth, use a mixture of iodine and pumice. Chalk or some good polishing powder should be used after the application.

* * *

Salol is a non-irritant and non-escharotic; is easily applied without pressure, in perfect contact with the exposed pulp, may be mixed with iodoform, aristol, or oxide of zinc if desired.

* * *

In deep seated caries, with great sensitiveness of dentine, fill with gutta-percha, touching the warmed and plastic mass to thymol crystals, which will exert an antiseptic and obtunding effect on the dentine.

* * *

A convenient application of nitrate of silver is to dip a silver wire in nitric acid and insert in the cavity. The action of the acid on the silver forms the nitrate in situ. The wire being easily directed, the application is made to the exact place desired.

* * *

To keep burnishers in good condition procure a very thick piece of sole leather, and with a sharp knife cut a small groove the whole length of the piece. Sprinkle rouge in the groove, and rub your burnishers in the groove till perfectly bright; rub a little hard soap on the surface of the filling before using the burnishers.

* * *

An impression can be taken in the following way with satisfaction to the dentist and patient: Take an impression in wax, and then cut out the wax under all hard places in the mouth, leaving the material so it will press up all soft tissue. Roughen the wax, and after placing very little plaster over it, insert in mouth, and force to place with considerable pressure to insure the condensation of all soft tissue. After plaster has thoroughly hardened and been removed from mouth, place a strip of heavy tin foil on each side of the impression, thus causing it to be a trifle narrower than the mouth, and allowing plate, when made to bind on each side of the ridge. A thin air chamber may be shaped nearly to conform to the hard ridge in roof of mouth.

## ALUMNI NOTES.

Not all the class of '95 have decided definitely upon a location. As will be noticed not all the names are upon the list.

J. F. H. Kuyper, Java.
C. P. Sweny, Cincinnati, O.
H. B. Hinman, Bucyrus, O.
L. E. Coonradt, Decatur, Ill.
F. E. Dodge, San Diego, Cal.
G. McA. Tyng, Victoria, Tex.
J. H. Billmeyer, Belleville, O.
D. Merner, Cedar Falls, Iowa.
W. G. Dunham, Albion, Mich.
N. J. Smith, Jr., Detroit, Mich.
A. L. Beatie, Pendelton, Oregon.
W. A. Lampman, Hastings, Mich.
J. B. Dowdigan, Kalamazoo, Mich.
D. Anderson, Maidstone, England.
C. B. Southwick, Mt. Pleasant, Mich.
G. A. Parmenter, Vermontville, Mich.
A. Barnes, temporarily at Petosky, Mich.
H. B. Respinger, D. E. D. G., Basel, Switzerland.
F. von Widekind, 4 Baum St., Cologne, Germany.
J. Merckens, 23 Jacorden strasse, Cologne, Germany.
A. G. Hicks has purchased a practice in Tacoma, Wash.
C. L. Thuerer, temporarily with his brother at Baraboo, Wis.

E. Dubuis, D. E. D. G., Geneva, Switzerland, will locate in Geneva.

Elizabeth von Bremen, 27–29 Newmarket, Cologne, Germany.

J. H. Stromier, 20 Regent Park Square, Strathsbungo S. S., Glasgow, Scotland.

G. F. Fiddyment, enters partnership with his preceptor, Dr. Stewart, Joliet, Ill.

F. F. Scott remains for one year in Ann Arbor before permanently locating.

Dr. W. A. V. Price, '93, of Cleveland, was with friends in the city during the May Festival season.

J. A. Bucknall, Detroit, Mich. Fyfe block, corner of Adams and Woodward Aves.

F. E. McLaughlin and J. H. Neeley have formed a partnership and will practice at Marion, O.

Dr. W. T. Wright, '88, of Albion, called at the college on May 17.

Dr. W. A. Hart, '94, who is located at Holly, Mich., was seen about the campus the first week in June.

Dr. F. P. Watson, '89, of Marine City, spent a few days with friends in the city during the May Festival week.

A few days after going to press with the May number, Dr. Walter Green of Ashtabula, O., class of '91, called at the college.

It was learned too late for publication in the last number that Dr. A. W. Hall, class of '94, of Quincy, Mich., was married in January last.

On Wednesday, June 12, Dr. Roy E. Bailey, '94, was married to Miss Clara R. Voorheis of West Bloomfield. Congratulations of the JOURNAL.

A recent letter to Dr. N. S. Hoff, from Dr. Carrie M. Stewart, '92, of Ft. Worth, Texas, tells in a modest way of the prosperity Dr. Stewart is enjoying.

Dr. J. A. McIndoe, '94, has been spending a few weeks in Ann Arbor. As a result of a minor surgical operation on his neck some of his time was spent at the University hospital.

Dr. C. B. Blackmarr, '83, of Jackson, spent a few afternoons in the operating room some weeks ago. His object was to choose a good operator as an assistant for the coming year.

Readers of the JOURNAL will regret to learn that Dr. Vernon A. Williams, class of '93, died on April 29, at Cloverdale, Cal. Dr. Williams was also a graduate of Vanderbilt University.

It is from the First Annual Announcement of the Dental Department of the University of Omaha we learn that J. J. McMullen, D.D.S., class of '93, was appointed professor of Orthodontia of that department and Secretary of the Faculty. The school is to be a department of the Medical school and its term will be one of six months, beginning on October 1 and ending April 1. The JOURNAL extends congratulations to Dr. McMullen.

Dr. W. H. Dorrance was, at the last session of the Board of Regents, granted leave of absence because of the return of the serious illness from which he suffered last summer, and is now under treatment in New York City. Late reports declare him convalescing.

On June 10 and 11 Dr. J. A. Snyder, '92, of Athens, Mich., was seen about the college. Dr. Snyder's visit was for the purpose of securing an associate in his practice and final arrangements were concluded with A. L. LeGro, '95. Dr. LeGro will have charge of the entire practice for the three summer months while Dr. Snyder is taking a vacation in Petoskey.

During the absence of Dr. W. H. Dorrance, Dr. Edmond Dubuis of the Senior class has been assisting Dr. Nancrede of the University Hospital in his surgical operations about the face and head. Dr. Dubuis possesses a considerable degree of skill and is certain to earn distinction in that line upon his return to Geneva, Switzerland.

## DEPARTMENT NOTES.

Miss Dessie B. Robertson will spend the summer at Bay View.

J. C. Snelling will be in his father's office this summer, at Elsie, Mich.

J. W. Bass will be found with Dr. L. A. Stewart, of Sullivan, Indiana.

F. A. Graham will be with Dr. Sherrett, of Lewisburg, Ohio, this summer.

J. P. Collett will work with Dr. Scott, of Celima, Ohio, during the vacation.

J. C. Todd may be found this summer with Dr. J. W. Todd, of Pittsburgh, Pa.

E. V. Deans will play ball with the Newport, Rhode Island, team this summer.

H. D. Watson will be with Dr. J. Ward House, of Grand Rapids, this summer.

C. B. Pettit, of St. Louis, Mich., will work in the office of Dr. C. H. Crandall, of the same place, during the vacation.

G. A. Edgar will be in the employ of his brother, Dr. W. R. Edgar, of Blissfield, Mich.

L. M. Dickens will do some laboratory work for Dr. W. J. Bell, '92, of Ishpeming, Mich.

A. Van Ark, during the summer, can be found in the office of Dr. Gillespie, of Holland, Michigan.

F. M. Bacon can be found with Dr. Deyoe, of St. Clair, Michigan, during the summer vacation.

A. Du Bois, of Neenah, Wis., will be with Dr. W. F. Garry, of the same city, this summer vacation.

J. C. Snook and C. G. Bates will take advantage of the privileges afforded at the summer school.

S. A. Farnum has been elected treasurer for the next college year of the Students' Lecture Association.

James Robins will be with his brother, Dr. R. J. Robins, of Toronto, Ontario, during the long vacation.

J. N. Clarke intends to round up the year's study with Dr. F. B. Dawley, '94, of Williamston, Michigan.

F. B. Powers has accepted a position for the summer with Dr. A. M. Phillips, of Battle Creek, Michigan.

C. A. Houghton has accepted a position with Dr. H. D. Wilber, '93, of Malone, New York, for the summer.

Drs. Darling and Huber left Ann Arbor June 2 for Germany, where they will spend the summer vacation.

H. E. Blunt, of Ann Arbor, expects to be with his brother this summer, Dr. C. L. Blunt, '92, of Sioux City, Ia.

A. J. Wildanger will take a few practical lessons this summer, in the office with Dr. B. F. Miller, of Flint, Mich.

B. F. Vosburgh will make things hustle about the dental laboratory of Dr. Will B. Elster, '94, at Flushing, Mich.

F. J. Lee was taken ill early in May, and after being confined to his room over two weeks left for his home June 1.

C. A. Phillips left college May 16 for his home in Terra Haute, Indiana, being called away by illness in his family.

W. S. Honey who always makes the best of present opportunities, will put his acquired skill to a practical use in the office with his brother, Dr. Honey, '91, at Kalamazoo, Mich.

F. W. Joslin intends to take advantage of an offer from Dr. Brown of Cadillac, Mich., to spend the vacation in his office.

J. Milton Rosenthal will do some practical work in his brother's office this summer, Dr. C. H. Rosenthal, of Cincinnati, Ohio.

H. J. Livingston has accepted a position with Dr. J. W. Denney, of Ft. Collins, Colorado, a town near his home at Denver.

A large number of the students availed themselves of the opportunity of attending the Tri-State meeting held in Detroit, last month.

O. W. Randall, of Port Huron, Mich., will resume his former position as assistant to his uncle, Dr. W. O. Randall, of the same place.

M. Templar was obliged by urgent business to return to his home in Oriel, Ontario, several weeks before the closing of the college for the summer.

G. W. Russell will give Dr. E. I. Backus of St. Joseph, Mich., a '94 graduate of the U. of M., a few pointers during his spare moments this summer.

Our genial friend, C. S. Bigelow, of the Ransom & Randolph Company, was made happy on May 22 by the arrival, at his home in Toledo, of a daughter.

G. H. Dennis will make a practical application of his year's work, by spending his summer vacation in his father's office, Dr. G. W. Dennis, of Lasalle, Ill.

H. D. Watson has been elected a Director of the Students' Lecture Association. The Directors for the Association are elected for a term of three years.

W. R. Slawson intends to be in the office during the summer vacation, with his brother, a graduate from this college, Dr. E. D. Slawson, of Bay City, Mich.

Some interesting lectures have been given to the Junior class by Dr. Hall on the treatment of pulp canals, sensitive dentine, placing the rubber dam, matrices, forceps, etc., so that the Senior class of next year can begin operating without a total lack of confidence and knowledge.

Drs. Anderson, Stromier and Respinger, '95, sail July 3 on the steamer New York, for England, these three gentlemen expecting to locate in the British Isles.

A. J. Reed will spend the sultry summer months at the famous watering place, the Les Cheneaux Islands. He will fill the position of clerk for the Les Cheneaux Club.

J. C. Arnold will be with Dr. E. F. Willison, of Eaton Rapids, Michigan, while his brother, F. C. Arnold, will spend the summer with Dr. R. D. Wood, of the same city.

Miss June A. Burr will spend a portion of the summer vacation in the office of L. S. Chilcott, of Bangor, Me. The remainder of the time will be given to recreation among the islands of the Penobscott bay.

W. H. Roper met with a serious accident May 28. While playing ball on that date he fractured the humerus of his right arm about two inches above the elbow. Dr. Darling reduced the fracture and "Duke" will be with us again next fall.

Owing to serious illness, Dr. Dorrance was compelled early in May to apply to the Board of Regents for leave of absence. He left Ann Arbor May 12 for New York City where he will be under special electrical treatment which cannot be obtained in this city. Late reports say that his condition is improving.

Since the last issue of THE JOURNAL, in which mention was made of the work to be done under the demonstrations of Dr. A. W. Haidle, the Freshmen have finished thirteen crowns and four bridges, practically covering all cases that may come under the dentist's general practice. The crowns include the following styles: Plain gold crowns for both upper and lower molars and bi-cuspids, the seamless crown, the Darby and modified Darby, the Richmond, Tube, Case, and Hollingsworth, the shell crown and the Downey porcelain crown. In the bridge work the following were given: Bridge for bi-cuspid, being attached to a crowned molar and bi-cuspid. The second bridge made represents a first bi-cuspid and a lateral incisor, held in position by a "crib" for second bi-cuspid, and band around cuspid. The third one demonstrated was for a removable bridge for the first molar and second bi-cuspid. These were kept in place by a wire crib for first bi-cuspid and band for second molar. The last one, a lower anterior case, represents a combination given more for practice than as being of great practical use. It includes the following make-up: Bands for both cuspids, the right lateral incisor is a Richmond crown, while the left lateral is a full gold shell crown. The two central incisors are facings backed up and swung in. The whole, when nicely finished, makes a beautiful piece of work.

## TRI-STATE DENTAL MEETING.

This meeting was pronounced by such eminent men as Professors TAFT, BARRETT, CUSHING, and BROPHY as the largest and most enthusiastic ever held in America excepting only the World's Columbian Dental Congress. The next Tri-State Meeting will be held three years hence, and probably in one of the large cities of Ohio. Why not invite Illinois and make it a Four-Leaf Clover Meeting? With a large delegation from Chicago, such as attended the meeting just closed, it is evident the meetings will be the more enthusiastic and the more largely attended.

Following is the programme:

### TUESDAY, JUNE 18.

#### 9 A. M., ORGANIZATION.

Address of Welcome; Theodore A. McGraw, M. D., Detroit, Mich., President Detroit College of Medicine.

#### RESPONSE ON BEHALF OF

Indiana Dental Association; M. H. Chappell, Knightstown, Ind.
Ohio Dental Association; W. H. Todd, Columbus, Ohio.
Michigan Dental Association; George L. Field, Detroit, Mich.

#### 11 A. M., PAPERS READ AND DISCUSSED.

The Dentist in his Profession and among the People, by S. P. Hartman, Ft. Wayne, Ind.

Discussion opened by J. C. Walton, Howell, Mich.

Resodontrypy, or Hullihen's Operation, by S. B. Brown, Ft. Wayne, Ind.

Discussion opened by Jonathan Taft, Cincinnati, O.

#### 2 TO 5 P. M., CLINICS AND DEMONSTRATIONS IN OPERATIVE AND PROSTHETIC DENTISTRY.

Tin and Gold Filling; J. R. Clayton, Shelbyville, Ind.

Knapp System Crown and Bridge-work, and the use of the Knapp Blow Pipe; Dr. Myers, Cleveland, Ohio.

The Hollingsworth System of Crown and Bridge-work; Dr. Hollingsworth, Kansas City, Mo.

Baking Porcelain in a Revelation Oil Furnace; H. J. Caulkins.

Baking Porcelain in an Electric Oven; L. E. Custer.

Local Anesthesia by Injection; N. H. Hiatt, Marion, Ind.

Local Anesthesia by Injection; N. S. Hoff, Ann Arbor, Mich.

Bleaching Teeth; F. C. Sizelan, Muskegon, Mich.

Anchor Screws in Gold Fillings; F. W. Temple, Grand Rapids, Mich.

Baking Porcelain in a Midget Furnace, with gas or gasoline, by H. J. Caulkins' Gasoline Generator and Blow Pipe; H. J. Caulkins.

Baking Porcelain in a Downie Furnace.

### 5 TO 6 P. M.

Individual Meetings of State Societies.

### 7:30 P. M., PAPERS READ AND DISCUSSED.

Etiology and Treatment of Alveolar Hemorrhage; Otto Arnold, Columbus, Ohio.

Discussion opened by W. L. Rawls, Indianapolis, Ind.

Generation and Degeneration of the Tissues of the Mouth; W. H. Whitslar, Cleveland, Ohio.

Discussion opened by J. R. Clayton, Shelbyville, Ind.

Habit Spasm; E. T. Loeffler, Saginaw, Mich.

Discussion opened by R. T. Oliver, Indianapolis, Ind.

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## WEDNESDAY, JUNE 19.

### 9 A. M.

Study in Dental Anesthesia; N. S. Hoff, Ann Arbor, Mich.

Discussion opened by L. L. Barber, Toledo, Ohio.

Four Requisites in Development; F. M. Ault, Kokomo, Ind.

Discussion opened by A. W. Haidle, Detroit, Mich.

Business Education for Professional Men; C. B. Blackmarr, Jackson, Mich.

Discussion opened by S. T. Kirk, Kokomo, Ind.

### 2 P. M., CLINICS AND DEMONSTRATIONS IN OPERATIVE AND PROSTHETIC DENTISTRY.

Some Preliminaries in Filling Buccal Cavities; C. B. Blackmarr, Jackson, Mich.

The use of Sulphuric Acid in the Treatment of Root Canals; J. B. Welch, Hudson, Mich.

An Exact Method of Treating Septic Pulp Cavities. The Saving of Time in the Construction of Porcelain Faced Crowns; C. J. Siddell, Kalamazoo, Mich.

Operation for Diseases of the Autrum; Henry C. Corns, Detroit, Mich.

Treatment of Putrescent Pulps; Fred A. Kotts, Manchester, Mich.

Fusing Platinum, using the Electric Furnace as a Rheostat; L. E. Custer, Dayton, O.

Filling Root Canals with Lead Points; W. L. Rawls, Indianapolis, Ind.

Soft Foil Filling; S. T. Kirk, Kokomo, Ind.

Staining Porcelain Teeth; G. H. Wilson, Cleveland, Ohio.

5 TO 6 P. M.

Individual Meetings of State Societies.

7:30 P. M.

The Development of Facial Contours in Dental Orthopedia; C. S. Case, Chicago, Ill.

Discussion opened by Geo. H. Cushing, Chicago, Ill., and James G. Reid, Chicago, Ill.

Bacteriological Pathology with Lantern Illustrations; W. C. Barrett, Buffalo, N. Y.

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### THURSDAY, JUNE 20.

9 A. M.

The Pathology of Inflammation; G. E. Hunt, Indianapolis, Ind.

Discussion opened by E. S. Holmes, Grand Rapids, Mich.

Some Incompatabilities; J. S. Cassidy, Covington, Ky.

Discussion opened by G. E. Johnson, Ft. Wayne, Ind.

The Unused Power in the Dental Profession; Jonathan Taft, Cincinnati, Ohio.

Discussion opened by E. G. Betty, Cincinnati, Ohio.

EXHIBITS.

New Method of Swedging Plates and Crowns; J. C. Parker, Grand Rapids, Mich.

New Self-regulating Vulcanizer, operated with oil; J. L. Sweetnam, Manistee, Mich.

Specimens of Mechanical Work, introducing some new features; E. H. Conway, Sault Ste. Marie, Mich.

Work of the Junior Class of the Northwestern College in Prosthetic dentistry; G. J. Dennis, Chicago, Ill.

Exhibit of Technical Work, Dental Department of University of Michigan; A. W. Haidle, Detroit, Mich.

A Case in Actual Practice, "Prosthesis Extraordinary;" Isaac Douglass, Romeo, Mich.

2 P. M.

Excursion to St. Clair Flats. Compliments of Michigan.

⁂

A handsomely engraved mirror commemorative of the occasion was presented to Dr. Geo. L. Field for his untiring energy in looking after the enjoyment of the guests. Dr. W. C. Barrett, of Buffalo, made the presentation speech and was as usual most happy in his remarks.

Following are the names of the officers of the Michigan Dental Association for the ensuing year: Drs. J. Ward House, of Grand Rapids, president; A. W. Diack, of Detroit, 1st vice-president; E. T. Loeffler, of Saginaw, 2d vice-president; B. H. Lee, of Grand Rapids, secretary; Geo. H. Mosher, of Jackson, treasurer; C. B. Blackmarr, of Jackson, member of Board of Censors. The next meeting of the Association will be held at Grand Rapids.

⁂

One of the most happy events of the meeting was the fitting tribute paid to Dr. L. E. Custer, of Dayton, Ohio, in the presentation of a gold medal by the Ohio Dental Association. Dr. Custer is a genius and has done much in the line of invention of electrical apparatus. His latest invention, the Custer Porcelain Furnace, will stand as a land-mark of progress in dentistry and will serve to hand its inventor's name down to posterity. Always genial, and modest in the highest degree; the JOURNAL extends him congratulations.

⁂

The excursion to St. Clair Flats was a revelation to many. A stop was made on the trip up at Parke, Davis & Co's. immense laboratory and the party was received at the landing by the brass band of that firm. After a brief view of the works liquid refreshments were served and the band accompanied the party on board where their music was interspersed with that of Schremser's orchestra. At the Star Island House a collation was served and the party re-embarked for Detroit. Taken as a whole it was a most pleasant and enjoyable trip and willbe long remembered by all. Much credit is due the local committee of arrangements, Drs. Geo. L. Field, A. W. Diack and J. Lathrop, Sr.

⁂

A number of students of the department attended the meeting. Among the Seniors present were D. Anderson, J. A. Bucknall, L. E. Coonradt, F. E. Dodge, J. B. Dowdigan, Edmond Dubuis, D. E. D. G., A. G. Hicks, M. L. Howver, W. A. Lampman, A. L. Legros, J. Merckens, C. F. Piper, H. B. Respinger, D. E. D. G., C. P. Sweny, C. L. Thuerer and G. McA. Tyng. The Seniors attended the meeting in order to visit the different displays of dental goods and secure prices for an office outfit and to listen to articles read directly related to their profession. They also became acquainted with the men whom they will mingle with in the future. Several of the Juniors were present at the meeting.

* * *

The annual meeting of the Supreme Chapter of Delta Sigma Delta Fraternity was held in Detroit, Monday, June 17. The meeting was held at the Russell House and convened at 10 A. M., S. G. M. Rollin B. Tuller, of Chicago, calling the meeting to order. In the afternoon the following members of the profession were taken into the Fraternity: Drs. Geo. H. Wilson, Cleveland, O.; J. Ward House, Grand Rapids, Mich.; T. S. Hacker, Indianapolis, Ind.; H. C. Raymond, Detroit, Mich. A banquet was held at the hotel in the evening. The officers elected for the ensuing year were Drs. R. B. Tuller, Chicago, S. G. M.; J. G. Reid, Chicago, S. W. M., A. H. Peck, Chicago, S. S., and P. J. Kester, Chicago, S. T.

## HANDSOME TRIBUTE TO DR. J. TAFT.

A special meeting of the Odontological Society of Cincinnati was held at the offices of Drs. H. A. and H. T. Smith, of Garfield Place, a short time ago, for the purpose of presenting to Dr. Jonathan Taft, of this city, a testimonial of appreciation and regard. A beautiful piece of French bronze, representing "Etoile du Matin," by A Gaudez, was the subject. Congratulatory speeches were made by each member present. Dr. Taft has been a distinguished practitioner, editor and teacher for half a century. He has also been an active member of many dental societies, as well as a pioneer in the work of establishing societies in all parts of the country. He is also eminent as a writer for professional journals. He was formerly Dean of the Ohio Dental College, of this city, and for 20 years has been Dean of the dental department of Ann Arbor University.

The following members were present:

Drs.—
J. Taft,
James Leslie,
Wm. Taft,
W. B. Fahenst'k,
C. M. Wright,
F. Hunter,
F. A. Lush,
G. Molyneaux,
H. T. Smith,
J. S. Cassidy,
C. T. Keely,
O. N. Heise,
H. A. Smith,
D. W. Clancey,
M. H. Fletcher,
W. M. Williams,
H. C. Matlack,
J. R. Callahan,
A. G. Rose.

—*Cincinnati Enquirer.*

## REPORT OF SURGICAL CLINIC.

To the Faculty of the Dental Department:

Twenty-four cases have been presented to the dental class in surgical clinic as follows:

| | | | |
|---|---|---|---|
| Anesthesia, | 3 | Epithelioma of lip, | 1 |
| Cancer of tongue, | 1 | Excision of lower jaw, | 1 |
| Anchylosis of jaw, | 1 | Partial excision, | 1 |
| Sarcoma of tonsil, | 1 | Tumor of upper jaw, | 1 |
| Hare lip, | 3 | Carcinoma of upper jaw, | 1 |
| Regeneration of tissue, | 1 | Secondary involvement of glands after removal of jaw, | 1 |
| Cleft palate, | 3 | | |
| Sarcoma of Antrum, | 1 | | |
| Epithelioma, | 1 | Epithelioma of upper jaw with secondary involvement of glands, | 1 |
| Necrosis of lower jaw, | 1 | | |
| Syphilis of soft palate, | 1 | | |

C. G. Darling.

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### American Dental Association Meeting.

The Local Committee have made arrangements with the following hotels and houses for the session of the American Dental Association commencing Tuesday, Aug. 6, 1895: The "Coleman House," fronting the ocean, the largest hotel in Asbury Park, with rates $3.50 to $4.00 per day, and the use of the ball room at stated periods of the day and evening for large committee meetings, and sections—The "West End Hotel," a first class hotel, opposite the "Coleman House," the rates $2.50 to $3.00 per day, with the use of the ball room at stated periods for committees and sections.—The "Ocean Hotel," next door to the "West End," capacity 900, first class in every respect, rates based on 100 or more Dental Convention guests at $2.50 and $3.50 per day, with the use at stated periods of small parlors for committees.—The "Hotel Brunswick," near the ocean, first class in every respect, from $3.00 per day up to $20.00 per week. This hotel has a series of small parlors on the main floor for committee and private receptions, the use of the same based on the number of Dental Convention guests at the hotel.

In the large hotels the use of the rooms for committees and sections is based on the contract of a certain number of guests, therefore the selection of a room ahead in some hotel is necessary—July 15th is the time most of the hotels would like to know. All hotels have electric lights, baths and artesian well water. In small hotels, "The Grand Central," rates $1.50 to $2.50 per day and $14.00 to $16.00 per week.—"The Ashland," $2.00 per day and $8.00 to $12.00 per week.—"The Portland," $2.00 per day and $8.00 to $10.00 per week.—"The Edgemere," $2.00 to $2.50 per day and $12.00 to $20.00 per week.—"The Neptune," a nice quiet place, $1.75 to $2.00 per day and $9.00 to $20.00 per week.—"The Albany," $2.00 per day and $8.00 to $15.00 per week.—"The Clifton," $2.00 per day and $15.00 per week.—"The Strand," $2.00 per day and $10.00 per week.

The Committee will have an attendant at the Auditorium from July 27th to Aug. 9th to give information in reference to hotels and other information to inquiring members. The trolly cars run direct from the depot to the Auditorium. A map of Asbury Park, the cuts of the hotels and the Auditorium will appear in the New Jersey programme which will be mailed to every member of the American Dental Association.

CHAS. A. MEEKER, Chairman.
C. W. F. HOLBROOK,
C. S. STOCKTON,
Local Committee.

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## National Association of Dental Faculties.

The Annual Meeting of this body will be held at Asbury Park, New Jersey, on Saturday, August 3d, at 10 o'clock, A. M. It is very desirable that all the colleges having a membership be promptly present at that hour, as much important business will be before the Association, and the time allotted is unusually short for the work to be done.

The Executive Committee of the Association will meet on Friday previous at 10 o'clock at the same place. All business for that committee should, so far as possible, be in their hands before the meeting in order that there be no delay.

J. TAFT, Chairman Ex. Com.
LOUIS OTTOFY, Secretary.
Masonic Temple, Chicago.

## ILLINOIS STATE DENTAL SOCIETY.

The thirty-first annual meeting of the Illinois State Dental Society was held at Galesburg, May 14 to 17, 1895. About 200 were in attendance. The following named persons were elected officers for the ensuing year: President, Walter A. Stevens, of Chicago; vice-president, C. R. Taylor, of Streator; secretary, Louis Ottofy, of Chicago; treasurer, Edgar D. Swain, of Chicago; librarian, J. R. Rayburn, of Fairbury; chairman of executive committee, W. A. Johnston, of Peoria. The next meeting will be held at Springfield, May 12 to 15, 1896.

Louis Ottofy, Secretary,
Masonic Temple, Chicago.

## REGISTRATION.

Section XIV of the dental law of Michigan provides that: "All persons not now registered who desire to practice dentistry in this state shall apply to the secretary of the Board (of Examiners) for registration. Each person seeking registration by virtue of a diploma shall send an affidavit to the secretary of the board, setting forth his name, place of business, postoffice address, the date of his graduation, and the name of the dental school from which graduated, and a registration fee of three dollars."

It will be seen that in order for the graduates of this college to practice lawfully in this state, they must register with the Board of Examiners. Violation of the law is punishable by a fine of not less than twenty-five dollars, nor more than one hundred dollars, or sentence to imprisonment in the county jail for a period not exceeding ninety days, or both; such fine and imprisonment is in the discretion of the court.

The present secretary of the board is Dr. G. H. Mosher, of Jackson.

## MICHIGAN STATE BOARD OF EXAMINERS IN DENTISTRY.

You are hereby notified that the next meeting of the State Board of Examiners in Dentistry, for the State of Michigan, will be held in the City Council Chamber, in the City of Jackson, on Wednesday, July 24, 1895, at 10 o'clock A. M.

All "Temporary Licenses" expire on above date, and cannot be renewed.

Graduates of Dental Colleges "with a course of instruction and practice fully equal or equivalent to that of the College of Dental Surgery of the University of Michigan" can be registered by furnishing the necessary affidavit and paying the fee, $3. All others are required to pass an examination before the Board.

Applicants for examination must furnish instruments, including dental engine, and sufficient gold for one or more fillings.

By order of the Board. GEO. H. MOSHER,
Jackson, June 13, 1895. Secretary.

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## LIST OF GRADUATES.

Following is a list of the graduates of the Dental Department of the University of Michigan for the college year '94–'95.

For the degree Doctor of Dental Science, (D. D. Sc.):
William H. Van Deman, D. D. S.; Charles T. Whinery, D. D. S.

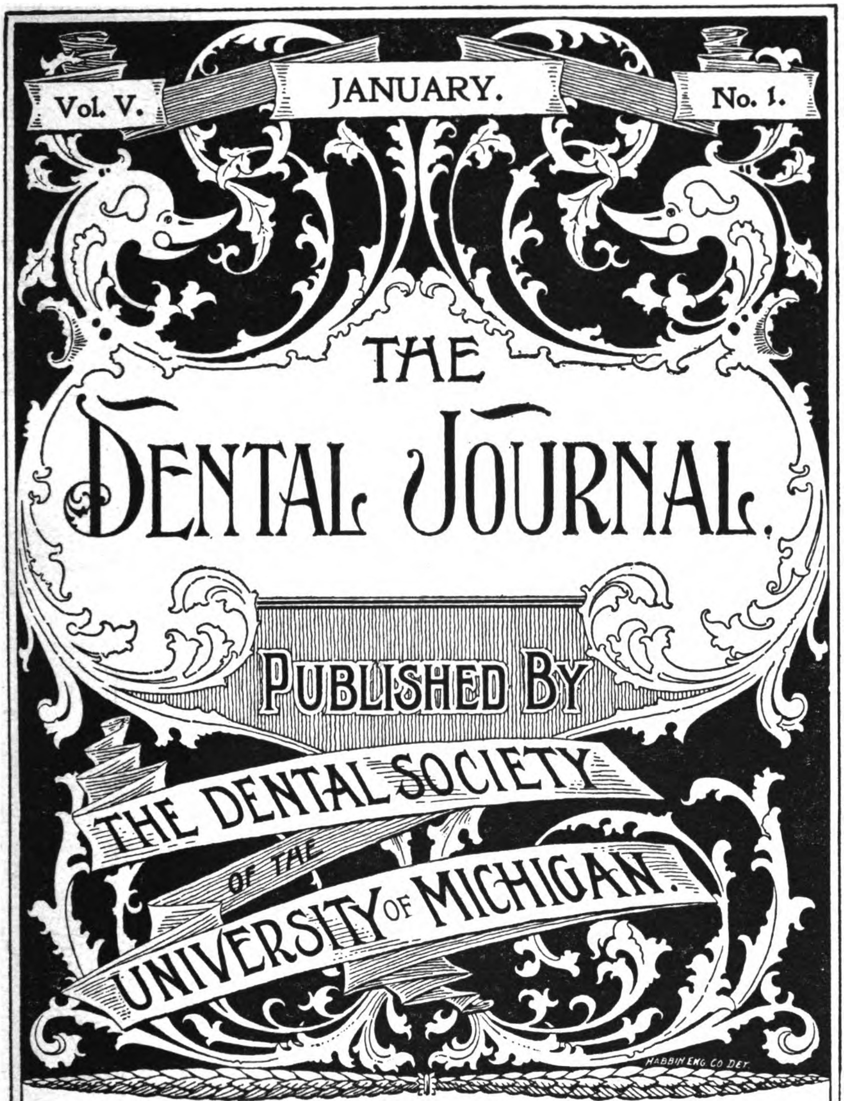
For the degree Doctor of Dental Surgery, (D. D. S.):

| | |
|---|---|
| Douglas Anderson, | *Maidstone, England.* |
| Archibald Elmer Ball, | *Flushing.* |
| Amos Barnes, | *Hillsdale.* |
| Orville M. Barton, | *Grand Rapids.* |
| Alfred Lee Beatie, | *Pendleton, Oregon.* |
| Joseph Henry Billmeyer, Jr., | *Holloway.* |
| Joseph Augustin Bucknall, | *London, England.* |
| Fred Chittenden Clapp, | *Allegan.* |
| Lewis Emmett Coonradt, | *Decatur, Ill.* |
| Mary Bruyn Crans, B.S., *University of North Dakota,* | *Grand Forks, N. Dakota.* |
| Fred Ellsworth Dodge, | *San Diego, Cal.* |
| John B. Dowdigan, | *Ann Arbor.* |
| Edmond Dubuis, D. E. D. G., *Dental Department, University of Geneva,* | *Aigle Vaud, Switzerland.* |
| Walter Gideon Dunham, | *Hanover.* |
| George Frederick Fiddyment, | *Lockport, Ill.* |
| Van Camp Garrett, D.D.S., *American College of Dental Surgery,* | *Watervliet.* |
| Fred Pratt Graves, | *Battle Creek.* |
| Arch Greenwood Hicks, | *Monticello, Ia.* |

| | |
|---|---|
| Harry Benson Hinman, | *Detroit.* |
| Marshal Luther Howver, | *Mansfield, Ill.* |
| Arthur Stimson Kennedy, | *Cedar Rapids, Ia.* |
| John Frederik Henry Kuyper, | *Holland.* |
| Walter Allen Lampman, | *Hastings.* |
| Harry Hallenbeck Lauderdale, | *Genesee, N. Y.* |
| Albert Leland LeGros, | *Santa Rosa, Cal.* |
| William Gustave Lentz, | *Ann Arbor.* |
| Frank Eugene McLaughlin, | *Milan, O.* |
| Joseph Merckens, | *Cologne, Germany.* |
| Daniel Merner, | *Cedar Falls, Ia.* |
| John Henry Neeley, | *Lancaster, O.* |
| George A. Parmenter, | *Vermontville.* |
| Clarence Fletcher Piper, | *Toronto, Ont.* |
| Harry Benedict Respinger, D.E.D.G., *Dental Department, University of Geneva,* | *Basle, Switzerland.* |
| Burt Townsend Ruthruff, | *Ann Arbor.* |
| Francis Frederick Scott, | *Ann Arbor.* |
| Newton J. Smith, Jr., | *Toulon, Ill.* |
| Charles Bradford McCall Southwick, | *Mt. Pleasant.* |
| Joseph Herman Stromier, | *Glasgow, Scotland.* |
| Clifford Paul Sweny, | *Mason, O.* |
| Andrew Roane Thorpe, A.B., *Vincent's Coll.,* | *Los Angeles, Cal.* |
| Christian Leonard Thuerer, | *Baraboo, Wis.* |
| George McAlpine Tyng, | *Victoria, Tex.* |
| Perley Tapley Van Ornum, | *Racine, Wis.* |
| Elizabeth von Bremen, | *Cologne, Germany.* |
| Friedrich von Widekind, | *Cologne, Germany.* |

## Books Received.

General Surgery and Pathology for Dentists, by Edmund W. Roughton, B. S., M. D., (London) F. R. C. S., (England). This comprehensive and concise work will make an excellent reference and text book. It embraces all the subjects that are essential to the education of the dental student in realms of Surgery and Pathology. It is divided into sixteen chapters, as follows: Inflammation and its results, Bacteria in relation to disease, Wounds, Surgical fever, Shock-Delirium, Hemorrhage, Fractures, Syphilis, Tuberculosis, Tumors, Cysts, Diseases of arteries, Diseases of veins, Injuries and diseases of nerves, Diseases of lymphatics, Diseases of bones. It comes from the press of J. P. Segg & Co., London, Eng., and that of the S. S. White Dental Mfg. Co., Philadelphia.



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# THE DENTAL JOURNAL.

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# THE DENTAL JOURNAL.

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VOL. V. JANUARY 1, 1896. NO. 1.

## EXTRACTION OF THE FIRST MOLAR.*

BY J. M. THOMPSON, D. D. S.

THIS subject is so closely related to that of Orthodontia that it is indeed really a part of that very interesting study.

In looking into the history of different nations, we find that we, as Americans, having descended from a mixed parentage, are a race endowed with inferior organs of mastication. Civilization has brought many types of people together, and while in other countries races intermingle to a certain extent, the United States leads the world in this respect.

A study of comparative anatomy will show what efforts nature has to put forth to produce harmony of the parts, in children born of mixed parentage. The large bones of the skull of the father transmitted to combine with the small facial bones of the mother produce irregularities which are hard to overcome.

The same rule applies to the teeth. The large teeth of the father are accompanied by the small jaws of the mother, and also the opposite condition. It is owing to these conditions that there is such a prevalence of deformities.

The temporary teeth of the children of to-day seem inferior to those of past generations. As a rule they are neglected and the process of decay attacks the first molar, before it is noticed, and results in its loss.

There are rules governing the extraction of all teeth which must be given consideration. The removal of any tooth should be attended with a perfect knowledge of the circumstances and conditions which have made such an operation necessary. Teeth should never be condemned until every doubt of their utter worthlessness has been removed.

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* Read before the Detroit Dental Society, November 9, 1895.

An error in judgment has caused many an operator to have visions of deformed faces and arches pass before him daily.

The wholesale destruction of the first permanent molar excites inquiry as to the causes and consequences of such a loss. This molar is the largest tooth in the mouth and is called by some the link between the first and second dentition. Its early eruption (which in some cases is at four and one-half years) gives to the permanent set a poorly constructed member, its crown being covered with inferior enamel, and the dentine lacking in substance and stability.

Fissures caused by the failure of the enamel plates to unite form resting places for food and invite decay. Other influences also hasten the breaking-down process, and these, crowned with the culpable ignorance on the part of parents, fill our offices with little patients suffering for the sins of the guilty.

In our efforts to educate our patients regarding children's teeth, too much stress cannot be put upon the facts relating to the eruption of the first molar, and that it is not, as is commonly supposed, a temporary tooth.

Tables showing the relativity of decay tell us that this molar is the first to be affected with caries. It therefore becomes necessary to watch its eruption carefully, and to do all in our power to preserve it. The period of its usefulness is between the time of its appearance and the eruption of the second permanent molar, as during this time it is the principal organ of mastication.

Its loss, with that of the temporary molars, throws the work of mastication upon the anterior teeth. This causes enlargement of the jaws, and usually a protrusion of the lower, giving the face anything but a desirable appearance, and some authors call it an apish or bull-dog face.

The jaws back of the bicuspids (owing to its absence) are necessarily weak from lack of nutrition and use. A general derangement of the digestive organs may also be caused by the lack of proper mastication of food. There is no better method of estimating the probable duration or life of a tooth than to remember the general rule that the time required for its development and growth may be considered as usually proportionate to that of its existence.

Another argument or law may also be considered, that the extraction of poorly formed teeth is often followed by a very marked improvement in the quality of the remaining ones, reducing the amount of tissue to be nourished, and giving an extra supply to that which is left.

Among the many arguments against the extraction of this tooth is the fact that its loss means a consequent shortening of the bite; this permits the erupting lower incisors to strike with increasing force against the upper, causing them to move forward. This is directly attributed to the decided difference in length of the deciduous and permanent incisors, the forward movement of the permanent being a natural consequence from lack of room. A gradual change in the position of all the teeth may result as well.

A point in favor of preserving the first molar is that it acts as a partial support to the crowns of the deciduous molars, thus aiding them in maintaining their stability, until they have fulfilled their natural functions. If this is done, a two-fold benefit has been derived, as at the time of the natural loosening of the deciduous crowns, the bicuspids are ready to soon take their places, and they, too, have been helped.

A premature extraction of this tooth allows the germs of the bicuspids to drift backward and causes the teeth to be erupted back of their natural positions. The second bicuspid is inclined backward, thus greatly interfering with its use as an organ of mastication.

The second permanent molar generally tilts forward and a V-shaped space between the two is a result. Food lodging in this space is very hard to remove, and causes decay. Operations upon the proximate surfaces of these teeth are very difficult.

If extraction becomes necessary from an over-crowded condition of the arch, the best time to operate is indicated by each individual case. It is best, however, to remove the molar at or before the time for the eruption of the second molar.

The incoming tooth will generally move forward and occupy the space without altering its upright position. It is well, if one of the teeth is defective and it has been decided that all four must be extracted, to preserve, if possible, the faulty one, and then remove all at the same time. The extraction of the entire four prevents the one-sided appearance so often found.

If the operation is delayed until after the second molar is in place it is well to await the appearance of the third molar, which will crowd the second molar into the place of the first molar.

The whole subject may be summed up by stating that nature has given to man two sets of teeth, and that each should consist of twenty and thirty-two respectively.

Any departure from this is an abnormality, and it is our duty to maintain the normal as far as possible. But, as the horticulturists use their pruning knives for the best good of their plants and vines, so must we, as dentists, remove unpromising dental organs, that those which are to remain shall be of the best possible quality.

## DISCUSSION.

**Dr. N. S. Hoff:** The assertion made by the essayist that the teeth of the people of this country are inferior in quality to those of peoples in other countries I am inclined to deny. I am too loyal an American to countenance such an assertion and firmly believe we have as good teeth as the people of any civilized country.

Regarding, however, the extraction of the first molar, I must say that I am decidedly opposed to its indiscriminate removal. In the majority of cases there results not only an unsightly space between the second bicuspid and second molar, and an imperfect articulation, but there is a strong tendency to a lack of development in length of the inferior maxillary.

In a careful examination of 304 cases of articulated plaster models, made from plaster impressions by the students of the University of Michigan, and representing the dentures of the students themselves, I found eighty cases which have a direct bearing on this question. Of these, fifty-six cases show a decidedly faulty articulation, while twenty-four show fairly good results. I have with me a number of these models, chosen impartially and illustrating both sides of the question, which I shall be pleased to have you examine. To me they show conclusively that extraction of the first molar can rarely, if ever, be done without resulting in some deformity, either facial or in articulation.

**Dr. J. A. Watling:** To me it is simply a question as to the time at which the first molar can be extracted with the best results. Frequently dentists will insert an amalgam filling into a badly decayed molar with the expectation of saving it for a few years. This is all wrong. In ninety-nine of every hundred cases, if this tooth is extracted at the age of ten or eleven years, the second molar will come in and occupy a good, upright position; will nearly, or quite, fill up the space left by the first molar, and both second and third molar teeth will be the better for it. On the other hand, if left in, you will usually lose not only the first molar, but perhaps the second, and are quite certain to have bad decay of both second bicuspid and second molar. In the upper jaw we have even better results than in the lower.

In my own mouth all of the first molars have been removed and the others are still in good condition. I contend that if they must be lost before the age of twenty-five, they should be taken out at the age of ten or twelve years, and thus insure having good second and third molars.

I have here a boy whose mouth I wish you to examine. All of the first molars were removed by me when he was ten years of age. He is now twelve and I am certain you will bear me out in the assertion that the results are good.

**Dr. W. H. Dorrance:** There is not sufficient time remaining for a full discussion of this subject, but this much I will say, that, in general, no tooth should be extracted until an absolute necessity exists for such an operation. I have noticed that exostosis occurs very frequently where there is mal-occlusion of the teeth, and mal-occlusion is certain to occur where a molar has been extracted.

**Dr. E. C. Moore:** The models shown by Dr. Hoff are to me valueless as proofs of anything detrimental to the extraction of the first molar. There is no evidence of the conditions present at the time of extraction.

**Dr. J. Lathrop, Sr.:** Even the most badly decayed molar, when capped with a shell crown, will last indefinitely, provided always that the roots are in good condition. I strongly object to the extraction of any tooth until it becomes absolutely necessary, especially in the case of children.

# THE USE OF RESORCIN IN CASES OF RECEDED GUMS.*

BY I. W. COPELAND, '96.

THE drug of which I am going to speak to-night, and the use to which I put it, has served me a very good purpose, and will you, if properly used.

Have you ever seen a patient with an accumulation of salivary calculus on the labial surfaces of the lower incisors and cuspids, but more often on the centrals alone, which had irritated the gums to such a degree that they had receded to quite an extent, leaving the teeth loose in their sockets?

I do not aim to apply this treatment to receded gums all over the mouth, but simply to the conditions I have stated.

This drug, resorcin, is comparatively little known, and less so in the use to which I put it. Not that I claim anything original in the use of it. I found a small article in some work about a year ago, and that led me to experiment. Resorcin, as it comes to us, is in the form of fine grayish crystals, freely soluble in water or alcohol. It is similar to carbolic acid in formula, phenol, as you know, having the formula $C_6H_5\,OH$, while in resorcin we have one of the hydrogen atoms replaced by one of hydroxyl, giving the formula $C_6H_4(OH)_2$. It is equally powerful as a germicide as carbolic acid, while it has very little, if any, of its irritating effects. If injected into mucous membrane it will neither produce inflammation nor abscess, but will vesicate it.

Dr. Hoff tells us there are two methods of using drugs: The empirical, in which we use a drug, the action of which is not known, to get certain results; and the rational, the more satisfactory, in which we use a drug whose properties and action are known to produce definite effects in accordance with these properties. It is on this latter method we base our use of resorcin.

The first thing to do in an operation of this kind is to remove every particle of salivary calculus from the teeth, being careful not to scratch or mar their surfaces, and to injure the gums as little as possible. Then take a piece of muslin, cottonoid, or similar material of convenient size, and place under the tongue to keep the saliva from flowing over and between the teeth. This will have to be renewed quite frequently during the operation, as any irritation in this locality causes a great flow of saliva. As we are to operate on a sensitive tissue, we must use some form of local anesthetic, and I hardly think it advisable to use any form of hypodermic preparation on account of wounding the gums unnecessarily. Any of the stronger solutions of cocain, or other topical applications are useful, but the following seems to meet these requirements very well indeed: Mix together one ounce each of chloroform, alcohol, and tincture aconite and add eight grains of morphine which has first been dissolved in the least possible quantity of water, preferably hot. Now with our lance we make circular incisions near the gum margin, or about one-sixteenth of an inch below it. Wiping off as much of the blood as possible, we apply a little of the resorcin on cotton and find the bleeding almost immediately checked, owing to the strong styptic qualities of the drug. Then securing as much dryness as possible, with a cement spatula or other suitable instrument pack the incisions with resorcin. Caution the patient about too severe brushing of the teeth in that region for a few days, and the operation is complete.

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* Read before the Dental Society, November 4, 1895.

The next day we find very little soreness in the gums. That is one of the virtues of this treatment. But the wound is distended through the action of the drug on the mucous membrane. This gaping of the wound necessarily raises the edge of the gum a little. In a very short time we find the wound filled in with granular tissue and quite a marked improvement in the conditions. The tooth is tighter, the gum adhering more closely to it and not having that puffy, inflamed appearance which it had at the time of the first operation. If in two or three weeks we think we can further benefit the patient by another operation, the process is exactly the same, being careful to have the incision just below the cicatrix left by the preceding operation. Sometimes by several operations of this kind we are enabled to raise the margin of the gum very perceptibly, thereby saving a tooth for several years that otherwise would have to be removed in a comparatively short time.

Do not be discouraged if the first time you use it you can not see any very decided results, for by continued use you will become better acquainted with its application, and will be able to see some marked improvements brought about by its use.

## A FEW THOUGHTS ON ARTIFICIAL DENTURES.*

BY J. W. LYONS, '96.

I HAVE been asked the question by dentists of years of practice why it was that in nearly all cases the young dentist just from college disliked to do plate work so much and was so thoroughly filled with the desire for operating. I have heard students express themselves that when they took up their own practice they were going to do just as little plate work as possible. In the majority of practices which we will acquire I am inclined to believe we will be called upon to practice this branch of dentistry quite extensively. In every office there is a certain amount of plate work to do and in the finer practices, where the least amount of plate work is to be done, it is all the more important that we make every piece a masterpiece, and therefore a most thorough study of this branch of dentistry is required. I am confident that we will never insert a denture, if we are wont to study, but that we will learn a great deal from all the conditions attending it. I believe much of our success as practical dentists will lie in our ability to construct successful dentures. I am afraid many of us do not fully appreciate the vast importance of this and do not grasp every opportunity and point of assistance until thrown upon our own resources, when we will fully realize our weakness in this branch of dentistry. I believe that of all that constitutes dentistry the mechanical forms the basis. And to make any thing that is beautiful in our art, especially in vieing with nature in matching the teeth, we must be more than mere mechanics, more than capable of filling a tooth or treating an abscess; we must be dental artists.

It is not enough that we fit the plate accurately to the gums; that we grind the teeth so that the joints may be water tight; that we make every joint so it cannot be distinguished; that we polish the plate till not the slightest scratch could be found nor the tongue find the least fault. We have much to do besides.

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* Read before the Dental Society, November 18, 1895.

Upon our skill, assisted by the laws of mechanics and geometry and the beauties of art, lies the expression we are to lend to the face. We must impart action to them. We must instil life therein or our labors are in vain. If the tooth lacks the proper color and shape, or is unskillfully set in the arch for the person it is intended, it is a failure.

It is a noticeable fact that with a large proportion of people the appearance of an artificial denture is the subject of more solicitude than the difficulty to be experienced in masticating or the prospect of trouble in wearing, and I have even known of cases where patients could not use them in mastication, but would wear them between meals. Bearing this in mind it is surprising with what utter disregard of the rules of expression so large a number of artificial dentures are constructed and are only fit to be termed "false teeth."

Among the prominent failures in the expression that I judge some of us will experience is that of: First, color; by which they are often detected at once. Second, length. Third, size of the teeth. Fourth, deficiency of form of each individual tooth. Fifth, want of prominence and of length of cuspid teeth. Sixth, too great length of molars and bicuspids, especially above. Seventh, too much evenness or similarity. Eighth, size of arch. Ninth, line of articulation may be too straight. It is said with some practitioners the same unvarying form is followed in the arrangement of teeth, leaving only the shade and size to be determined by the requirements of the case, while some even ignore all discrimination in these particulars and insert teeth of the same size, shade and form in each and every instance. The shade and size of teeth may be advantageously studied in connection with the subject of temperament. With patients in whom the bilious type prevails we shall find required the dark or bluish tint and long narrow shape, not so strongly marked in the latter particular, however, as in the purely nervous temperament, where the teeth are almost invariably narrow, whether dark or light in shade. Where the sanguine temperament predominates the length should be less marked in relation to the width and the shade should approximate to white, with a yellowish tinge. The lymphatic patient usually requires a short, broad tooth, though rarely approaching the shape of those of the sanguine temperament; the color should be white or of a chalky appearance.

The arrangement of the teeth forms a very important part which necessitates the study of the conditions thoroughly and should be arranged much the same as the natural ones were, unless the natural teeth were irregular or over-crowded in the arch, which would necessitate a change or variation from that form.

Upon the lateral incisors and cuspids depend much of the expression which is given to the face. In many cases the too great projection of the bicuspids tends to increase artificial appearance, but the twist given to the cuspid will remedy this. We should bear in mind that the teeth appear whiter when placed in the mouth, from their contrast with the red color of the lips and the darkness of the mouth generally. Lady patients, especially, are prone to desire teeth of a much lighter shade than natural expression would possibly admit. By yielding to their wishes many times we will in the end do ourselves more injury than by following the dictates of our own judgment at the risk of incurring their temporary displeasure.

The hygenic relations: In view of the various pathological conditions existing from the wearing of artificial dentures it is of the greatest importance that the highly injurious influences which such appliances often exert should be recognized and eliminated as fully as possible. We find under this head two classes of disturbances, local and systemic. Under the first by far the greater number of morbid phenomena exist, although instances of marked constitutional disturbances have been traced to the wearing of artificial dentures where, by reason of mal-adaptation or of unsuitable material used in construction, it has set up and maintained an amount of local irritation sufficient to produce unmistakable systemic derangement. It should be borne in mind in all instances that in inserting an artificial denture of whatever character a foreign body is introduced into the oral cavity which, under certain conditions, may act in greater or less degree as an irritant to the tissues or organs with which it comes in contact; hence a careful study should be made of all the phases in each case, so that the irritant action may be reduced to a minimum.

Want of proper adaptation may become a source of inflammation productive of an amount of morbid activity varying in degree from a simple reddening and chronic inflammation of the tissues without hypertrophy, to the production of malignant growths. Rough surfaces, projecting edges or points, or unequally distributed pressure upon different portions of the hard palate are causes for irritation which may result in inflammatory action, either acute or chronic, causing, in many cases, a rapid absorption of underlying osseous tissues with hypertrophy of mucous membrane, or may cause suppuration and abscess with sloughing of soft parts. Dyspepsia and other systemic disorders may be the result of an ill-fitting denture because of the patient not being able to masticate properly. Lack of cleanliness on the part of the patient may result in highly inflamed underlying mucous membrane, causing in time very badly diseased tissues.

## TRISMUS.—A CASE IN PRACTICE.

BY J. AUSTIN BUCKNALL, D.D.S., DETROIT.

Mrs. —— was sent to me on the 25th of September to obtain relief from a closed jaw.

The opening being insufficient for more than the finger, cold applications in the form of a bandage over the affected parts were tried. This proved of no avail, for in three days or so the tonsils gave trouble and quinsy set in. It is a well known fact that quinsy will contract the muscles of mastication partly, if not entirely, the inflammatory process passing to the tissues immediately surrounding the maxillary articulation; the glands, even the cervical, becoming swollen and painful to the touch. Erysipelas, too, of the fauces and pharynx may cause temporary paralysis of these muscles. After the quinsy had broken, and it being equally certain that there was no erysipelas, while the closure still continued, trismus was given the credit for the trouble. This may happen temporarily from contraction of the muscles of mastication, especially the masseter, due to irritation from an uncut third molar tooth, pressure being exerted on the neighboring structures for want of room between the second molar and the ramus of the jaw; tonic spasm of the internal pterygoid and masseter resulting. Torticollis and paralysis of the muscles of the arm and hand have been known to result from this, relief being obtained by extraction. In this case, however, there was apparently little inflammation. The first and second molars of the lower jaw were all in fragments, while both lower third molars were apparently fully erupted. The upper jaw was minus a molar on each side and the third molars were both erupted, no pressure being exerted on the lower third molars. Several attempts to open the lower jaw sufficiently for extraction were made, but without success, until it was finally decided to give chloroform and remove all carious roots and the two lower third molars, as, from their proximity to nerve trunks, relief might be obtained. This was done on the 19th of October, a number of fragments being removed. One of the latter was unusually large and had a large cavity on the posterior surface, while one root was arrested in development on one side, the apex being much curved outwards, but the foramen well open. The desired result was slow in coming, trismus passing off only very gradually, but at the present time two fingers can be placed where a pencil had to be forced the day of the operation.

The impression may be gained by some that extraction would always be necessary. This is not so. Removal of flaps over the third molar or proper treatment of the exposed nerves in the first or second molars when badly decayed may suffice. Again, the most decayed molar might be extracted as an experiment, to obtain relief, rather than the third molar. Examination of an upper third molar might show cause as pressing unduly below.

As an interesting episode and to show an ordinary case, the assistant in my office developed trismus necessitating the extraction of a newly erupted lower right third molar, relief being apparent in a short time.

## FERMENTATIVE CHANGES IN THE HUMAN MOUTH.*

BY F. M. BACON, '96.

In this age there no longer remains any line of work in which Nature does not throw open in her mysterious way the most wonderful avenues of revelation to the careful observer and thinker. This is true, not only in our every day walks of life, in connection with the smallest things, but of the professional man, the man of letters and of science. Nay, how truly is this illustrated in the specialist! For not only are these wonders revealed to him, but by unceasing inquiry he is able to make himself familiar with the details and causes of these phenomena. It therefore behooves us to exert every energy to do our work so well in our own immediate line that we shall be a credit to our fellow-men, and that a rising generation shall, in the harvest time, reap the golden fruit of our knowledge. In order that such an end may be attained, our attention must not only rest with the mere glimmer of the surface, of our every day mechanical work and a few thoughts and theories from books whose practicable side we doubt, but we shall have to dive below to procure the precious gem, original research.

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*Read before the Dental Society, November 18, 1895.

Methinks you say that so formidable an opening means the discussion to follow is made up of original thoughts and experiments. So lèt me lay aside the shadow of a doubt, if there be any. This subject, as you know, is widely treated, and it is only from past research I desire to gather such a rude outline of the work as you have permitted me to present to you to-night.

The apparatus which has been used for the work in hand, so far as I shall take you, is indeed quite simple.

1. A double-walled incubator with a gas regulator.
2. Koch sterilizer.
3. Damp chambers.
4. Drying oven for sterilizing instruments at 150°.
5. Good microscope.

Of course it will be understood that an apparatus was necessary for making chemical analyses of the products of fermentation. It may also be well emphasized that all instruments were thoroughly sterilized by putting into the flame of a Bunsen burner, or, when it was impossible to do this, they were placed in a dry oven for fifteen minutes at 150–160°. It may also be of interest to note the media employed for cultures, though this has been very strongly impressed upon us on previous occasions, sterilized saliva, sugar, starch, milk, and a decoction of malt.

I will now give a few fundamental experiments from Dr. Miller, of Berlin, which have been employed with the end in view of obtaining the actions and results or certain germs, at the same time learning something of their habitat.

*Experiment I.*—Saliva is mixed with sugar and starch, 1–40 parts, and kept at blood temperature. This invariably becomes acid in four or five hours. But some one, no doubt, will say that this is a result of no consequence because the experiment was not made in the oral cavity.

To overcome this, and prove that the acid was the same in either case, a test-tube filled with starch was fastened to a molar tooth upon retiring. The next morning the contents of the tube were acid as before. Now the question may be raised: Does the ferment exist in the starch or in the saliva?

In order to prove this in a satisfactory manner the mixture of starch and saliva was reduced to 100° C for half an hour. After being placed in an incubator for a number of hours it was found not to have become sour. Now again the starch is heated to 150° before mixing with the saliva, and in this case the solution becomes acid. We may safely say that the ferment is in the saliva and not in the starch.

I shall now take the liberty of presenting to you three experiments from Miller's works:

*Experiment I.*—Each of thirty small test-tubes was furnished with eight drops of a solution of saliva and starch sterilized; each of thirty other tubes was filled with eight drops of a decoction of malt and sugar sterilized. Twenty-four were then infected from the mouth; twenty-four infected from carious dentine and twelve remained pure.

*Experiment II.*—In this case Miller made a solution of fifty parts of saliva and one of starch. He put equal portions into two flasks, A and B, and covered the surface of the solution in A with a layer of pure oil to prevent free access of air. The quantity of acid in A will be the same as in B. From this it was seen the fungus in question was independent of the free access of the air for its growth and development. This conclusion, of course, at once excludes the mycoderma aceti. Now the fact of developing the fungus in the absence of oxygen is of the greatest importance, since it must be dealing in a direct manner with these germs of dental caries whose life and growth is deep down in the dental tubules and tooth structure where there is no air.

A final interesting experiment was conducted in this manner: Fresh saliva was mixed with starch and placed into an incubator. The oral cavity was cleansed with pure water, tooth brush and floss, in order to free the mouth as far as possible from all microörganisms. After the cleansing operation the saliva is again obtained, mixed with starch, and upon standing in an incubator for a length of time equal to that in the first instance it is found that there will be scarcely one-fourth as much acid produced. This proves that by frequent cleansing the greater portion of the fungi are removed and consequently less acid appears. In the latter experiments microscopic examinations revealed always the presence of a fungus and this usually in the form of diplococci, either single or in chains, often in the form of bacteria, bacilli or even threads. These forms, it is stated, are frequently upon a single thread, which is characteristic of Leptothrix bacillus, these forms depending, of course, upon the media and age of culture. It has also been found that the acid production of the fungi of this class was not apparent at all times, but depended upon the media. In short, this acid condition occurs only upon carbohydrate material. From this we conclude that we have germs agreeing with the bacteria acidi lactici, which grow upon carbohydrate materials in the absence of oxygen and produce acid. Hence we have no other than the fungus of lactic acid to deal with, which Miller has, however, chosen to prove by further experiments.

We have, from the above experiments then, studied the means of obtaining access to the micro-organisms of the mouth. We have determined the principle fungus incident to caries as that of the fungus of lactic acid. Let us now watch the effects of this kind of fungus upon the tooth substance. The saliva at the best, especially in the mouths of uncleanly persons, is impregnated with sugar taken directly or by the action of ptyalin on starch. This accumulation of sugar becomes fixed between the teeth and in the fissures, necessarily becoming acid as we have before seen. As the dentine becomes decalcified it acts as a sponge, taking up the liquids and fungi of the mouth. New layers of softened dentine are continually being broken, the germs ever following deeper and deeper until the organic and inorganic structure are lost.

We have thus far studied the effects of one class of germs. It must be kept in mind, however, that there are many other varieties. For the purpose of studying these classes the outer layers of dentine are found most excellent, for the reason that many germs here found require plenty of oxygen to live. Pure cultures are made and are found to consist of cocci or diplococci, single or in chains, and, for the most part, without motion. So far, investigation has failed to detect spore-producing bacteria. The involuted forms present characteristic appearances. We find quite often that the protoplasm contains granules, and sometimes there is found about the germs a gelatinous sheath.

Miller has demonstrated that if one takes a large number of these cultures there is found a second fungus differing in many respects from the one just described. This fungus occurs chiefly in bacilli, diplococci, etc.

For some time before this, the fact that in dentinal tubules would be found transitory forms, leptothrix to bacillus, bacillus to bacteria, and so to cocci, was not believed, though the fact was adhered to by many men of science. But by the discovery of fungi the fact has been clearly demonstrated, and, as Miller says, "those who maintain that such cases may not be found are responsible for their own mistake."

We have, then, two definite forms of fungi. The one always, and the other probably, present. The first fungus we know produces lactic acid, and the second fungus undoubtedly, though the acid in the latter case is always produced in the presence of the former fungus. These microörganisms require sugar of some form to work upon. The fermentation is most active at 35°–40° with no production over 50° or under 15°. In addition to these we find many other forms, and still others to be worked out by the men of science, in whose ranks let us hope to see enlisted some of our fellow students.

## THE SINCERE DENTIST; A PUBLIC BENEFACTOR.*

BY LESTER GEORGE, '98.

EVERY high minded young man, on starting out in life, is desirous of having laid a foundation on which he can rear an after-life resplendent in its deeds of nobleness and self-sacrifice.

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* Paper selected in open competition, for the Freshman editorship of THE JOURNAL.

To show that the students of dentistry are afforded just such an opportunity shall be the object of this paper.

Many professions and callings in life are attracting the attention of young men, but none offer more flattering inducements than that of dentistry. True, other professions may bring larger financial results; but we should ever hold in mind that money is not all of life. It is unnecessary to rehearse to you the progress that has been made in the dental art during the last half century, for that is an old story to you all; but if I can impress upon your minds the fact that with the ever-increasing knowledge of dentistry there are also growing up new opportunities for public and private benefaction; then, indeed has good been accomplished.

In this, our country, we find three professions which are directly related and concerned in the welfare of every household. The first profession is represented by the family physician, the man who is with us from the time of our reception into this world until in death we take our departure. May unnumbered blessings rest upon the head of the family doctor.

The second profession is represented by the minister of the gospel, the one who kindly leads us to forget the worry and care of this life, and think for a time of that life where questions that trouble do not arise. How we appreciate the gentle administration of that just one!

And then last but not least, the third profession, sustained by the family dentist, the one who preserves that which adds so much to the beauty in our lives, and which takes from old age its most unwelcome feature; the one who stands ready to administer timely and kindly relief when troubles assail. Every year finds him more in demand; his services more appreciated.

I have in mind a dentist who has plied his chosen profession for over twenty-five years in the same community. He has patients who first came to him when children, who have since grown to manhood and womanhood and now send their own children to him for dental service. He is a welcome guest on all important occasions in the affairs of the different families which he delights to call his own. He is loved and respected, not only because he is a careful, thorough workman, but because he conducts himself as if he had a personal property in the good will of the patients whom he has watched over for years.

What a noble record! What young man would not desire to have such?

At this point in the consideration of the subject, the question arises: If the dental profession is so varied and presents so many phases of usefulness, what qualifications should the dentist have beside the mere knowledge of dentistry? Only two will be mentioned.

First of all, the successful dentist must be a man of exemplary moral character. In the second place, he must be possessed of a superior education. How can a young dentist hope to win the confidence, the respect, or the good will of his patients if he possess a loose moral character? If he allows the report to get abroad that his conduct in and out of his office is ungentlemanly? No—good moral character must be maintained.

Then, in the second place, the education is very important. As has been shown, the sincere dentist lives in the midst of the families represented by his patients; to many of these families an extensive education is unknown; to such the influence of an educated dentist can not be estimated. Then, again, the dentist, if he would properly retain the position in the social and business world which the profession has secured for him, must be an educated man. The truth of this statement is even now realized; the time is not far distant when the requisite for admission to dental colleges will be much in advance of the present. Possibly a college education will be the requirement. Whatever it may be, the higher the better. Too much education can not be obtained for the carrying out of this professional life.

In conclusion, fellow students, permit me to remind you that to you is given the exceptional privilege of acquiring a profession which will gain for you an entrance into the best families in the communities where you shall reside, there to exert an influence for their good, and your own profit. Improve every opportunity! Fill every idle moment!

To remove the brown color often seen on black rubber plates immerse the piece in bisulphide of carbon for a short time and rinse in water to remove odor.

## BRAZILIAN LETTER.

Through the kindness of Dr. Watling the JOURNAL is enabled to publish the following interesting extracts from a personal letter received by him from Dr. J. A. Cook, '94. The letter is dated Campinas, Brazil, November 2, 1895.

" * * * And yet to be a stranger in a strange land where only Portuguese is spoken is not a very pleasant prospect. Within an hour after landing I was fortunate enough to find a man who spoke English and secured him for a guide. By means of the influence of six or seven dollars in tips the slowest custom house in the world was passed in about one hour. I saw people clamoring for their baggage who had been there for two or three days. Sometimes it takes weeks. * * * I saw in Rio the best furnished and most inviting dental parlors I have ever seen. I had a thirteen hours' railroad ride from Rio to Los Paulo and a three and one-half hours' ride from the latter city to Campinas. The scenery along the line was mostly uncultivated hills and small mountains. The railroad was contracted for by the mile and is built to cover as many miles as possible. Yet it was interesting to wind around the mountain tops with light, fleecy clouds rising from the hills below. During the whole trip I did not see a good wagon road outside of the towns nor a well cultivated field.

"Coffee is the chief product about Campinas. The coffee farms are very valuable, and the men who have them live like lords. Living expenses are enormous, as you can see, for all food stuffs are imported. We have potatoes from Spain, butter from Denmark, etc. Campinas is a place of from 35,000 to 40,000 inhabitants, and the negroes are far in the majority. The business streets are stone-paved, and we have the benefit of gas street lamps, mule-propelled street cars and a very good water supply. Five years ago the city was depopulated by yellow fever and there was a scare last spring. People left the town panic-stricken, some not even changing their clothes or locking their houses. The streets are kept remarkably clean, but the poor people have filthy homes. Drinking and other vices are carried to a fearful excess, and are one cause of such frightful fatalities during the fever season.

"Dentistry has the appearance of being a big thing in Brazil, but is not what it seems to be. All our supplies come from the States, and besides the time we have to wait for them there is a duty of forty per cent."

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## EDITORIAL.

According to Secretary Wade's enrollment, there are at the University of Michigan at the present time 2,850 students. This is an increase of 160 over the enrollment which stood last year unprecedented. The usual increase in the coming weeks is expected to bring the figures up to more than 3,050. This showing is particularly gratifying because the time has come when the multiplication of educational institutions throughout the west is expected to have some effect on the growth of our own university. Neither Yale nor Harvard is holding its own this year as well as Ann Arbor; indeed, Yale has suffered an actual falling off and Harvard, second in athletics, is doing some crowing over the college whose best boast now is that it excels Harvard in the strength of its foot ball team. The explanation of the popularity of the University of Michigan in the face of the competition that exists all about it, must lie in its deserved reputation. What business men call "good will" is something that our university must have a good deal of. Its graduates are dispersed through every state in the Union. Naturally, all other things being equal, the fathers will incline to send their sons to their own *alma mater*. Especially will they desire to do so if the institution continues to stand first-class among the institutions of the country. This our University has done. It has received in years past the most liberal support from an enlightened people and it has met this support with the kind of growth for which the support was given. The steady advance of the enrollment from year to year is gratifying, though it need not be surprising.

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The new dental law of New York, which went into effect August 1, is so radically unjust and at variance with the common law of our land that the Journal doubts if it would stand if appealed to the courts. To place the power of revoking a license for sustained charges of unprofessional or immoral conduct, or of gross ignorance or inefficiency in his profession in the hands of the Board of Regents of the State is giving that body autocratic powers which even the courts do not possess. If a person is a menace, through his profession, to the public health or morality, obviously the only legal manner of depriving him of his means of livlihood is by trial before a jury. Examination of candidates for license to practice within the state is provided for by the new law by the creation of a Board of Dental Examiners, which is given the power, in connection with the Board of Regents, of placing the educational standard at its own sweet will. There is no specification of the subjects upon which the candidate will have to pass his examination, and no provision for appeal in case the applicant has reason to believe he has been unfairly treated. While legislation is a necessity in the advancement of the profession and essential to the protection of both the dentist and the public, let us place that legislation on the broad basis of justice to all, which is so characteristic of our American institutions.

WITH the election of the present officers of the Dental Society a new policy has been inaugurated. In the past, instructors from the Dental and Medical schools and persons interested in some new invention of interest to the profession have been invited to speak before the Society. While these lectures, demonstrations, etc., have been instructive and interesting to the students of the department, they have defeated the very object for which the Society was organized several years ago. During the coming year no one not an active member of the society will be asked to contribute to any of the programs which will be presented. The papers read and discussed will be those written by members of the Society. This step has been taken that students, when they leave their *alma mater*, may be conversant not only with the rules governing bodies of men, but may also be able to speak intelligently and without embarrassment in the various national, state and county societies with which they may become affiliated. If this line of activity is closely adhered to we predict that the members of the Society will leave the college not only better equipped to practice their profession, but more thoroughly competent to meet intelligent and educated people.

THAT dentistry is a progressive science and art is well attested by the large number of dental journals and periodicals which receive the support and encouragement of the intelligent dentist. There can be no standing still in these closing years of the Nineteenth century; a dentist, if he keeps not well abreast of the onward movement of his profession, is compelled to become a mere camp-follower. While the various dental societies are one of the chief factors in this advancement, much has been accomplished by the dental publications. Not only are civilized nations aware of the importance of having a dental literature, but even the semi-barbarous countries are awaking to the necessity of having a medium for the transmission of ideas, dental journals having recently been established in Japan and Russia. We are confident that in less than one generation every recognized government will have its own dental publications. With the wonderful advance made in dental literature in the past few years, it is gratifying to us, as Americans, to remember that the first dental journal published was issued on American soil.

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THE Freshman editor of the JOURNAL for the ensuing year has been chosen, as was last year ordered by the Dental Society, by his ability in journalism, the choice being made by the Board of Editors from papers submitted. Many excellent papers were received and all were given an impartial hearing by the Board, the one written by Lester George being selected and his name submitted to the Society for confirmation. It is exceedingly gratifying to note the interest evinced by members of the Freshman class not only in the JOURNAL but in the Dental Society. With but few exceptions the members of the '98 class have signed the constitution of the Society and enrolled their names on our subscription books. With the interest manifested by both the Junior and Freshman classes, we predict in the near future an enlarged field of usefulness for both the Dental Society and its organ, The DENTAL JOURNAL.

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PROBABLY the most absolute necessity of the Dental Department is that of better ventilation and light in the operating room. While the ceilings are comparatively high there is no outlet for the impure and heated air except by means of a few small dormer windows, and with the presence of perhaps one hundred and fifty persons in this room for several hours the ventilation should be the best obtainable by modern and scientific means. Several large sky-lights would not only improve the present poor light with which the students have to contend on dark days, but would also provide an exit for the foul air occasioned by the presence of so many people. While the Regents are obliged, because of the hostility of the last legislature toward the University, to be economical in their expenditures, it would seem only just that part, at least, of the earnings of the operating room should be applied towards the comfort and good health of those students who increase the general fund of the University several thousand dollars annually.

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THE energy with which the attorney of the State Pharmaceutical Association is following up those druggists who are violating the law relative to the registration of clerks is commendable, and is a valuable pointer to our own state association. In only a few instances during the past year have dentists been called upon to show cause why they should not be fined for practicing without a license. This is not as it should be. While the law is not, in every particular all we could desire, still, why not make the best of existing circumstances; take the Pharmaceutical Association for an example and employ an attorney to push cases against those dentists who are illegally practicing within the confines of the state?

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ENOUGH cannot be said condemning the tendency of some students to indulge in rushing in the main hall of our building immediately after nine o'clock. It is embarrassing enough for patients who arrive in the morning for prosthetic work without the addition of dismay engendered by the noise and confusion following any needless disturbance.

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WITH this year the JOURNAL makes its appearance in a new dress. This, together with the contents, we hope will meet the approval of our readers. In consideration of the fact that the subscription rate has been reduced to one-half the original price, while the quality of the reading matter has in no way deteriorated, but rather improved, should cause not only our old readers to renew their subscription, but should place on our books large numbers of our alumni.

## MISCELLANY.

This department of The Journal will be devoted to methods of operation, formulæ, treatments, or anything that may occur of interest in the every day practice of the profession. Contributions are earnestly solicited.

* * *

An offensive breath may be made pleasant and agreeable by the free use of listerine diluted with water and used as a gargle several times a day.

* * *

A ten per cent. solution of boro-glycerine in water will sterilize forceps, broaches and all cutting instruments, and leave them without any unpleasant odor.

* * *

The law in Germany is very rigid in regard to the testing of vulcanizers. Every vulcanizer must be tested at stated periods the same as a steam boiler, and any one violating the statute is promptly fined.

* * *

An effectual sterilizing agent for use in the office may be made of lysol ʒiv, and water ℥xii. Make this solution alkaline with soda or some other alkali. All small instruments may be sterilized in this solution without fear of any corrosive action. Leave instruments in solution five minutes.

* * *

In Japan a Dental Society has been established known as "The Dental Investigation Association." This oriental society which has a membership of over five hundred has a classification of its members which is unique, recognizing, as it does, the purely mechanical dentist. Its members are divided into four sections, viz.: Those who have passed the national examination; foreign dentists practicing in the country; those who have permits to practice, and students in mechanical dentistry.

THE state board of health has sent a circular to all railroad companies instructing them to look out for relatives who disguise contagious diseases by means of technical names and thus secure transportation for corpses, which under ordinary circumstances would be denied. This law, if strictly observed, will effectually stop the spreading of infectious diseases in this manner.

* * *

STUDENTS who intend to practice in the state of New York must pass a rigid state examination. There are five of these examinations during the year, the different dates occurring September 24–27, 1895; January 28–31, 1896; April 7–10, 1896; May 19–22, 1896; June 16–19, 1896. Places at which examinations are held are New York, Albany, Syracuse, and Buffalo. Each candidate is notified at what point he will be examined. The subjects covered are anatomy, histology, chemistry, metallurgy, operative dentistry, therapeutics and materia medica, physiology, hygiene, oral surgery and prosthetic dentistry.

* * *

SALOL may be used to fill roots by applying the dam, drying the cavity thoroughly and using some good sterilizing agent, then place the crystals of salol in the cavity and pass a hot root drier through the powder, which at once melts and follows the instrument into the canal, by capillary attraction passing to the apex of the root. By repeating this a few times the canal may be entirely filled with the liquid salol. Next a warm tin or copper canal point is passed into the canal and carried as far in as possible without protruding through the apex. It is left for a short time to cool when the canal point will be solidly embedded in a crystaline, antiseptic mass which fills the canal completely. The salol may be melted in a test tube and then introduced into the canal if it is impracticable to place the powder in the canal. Care must be used not to overheat beyond the melting point. A small glass syringe slightly warmed will serve to inject into the canal.

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Every morning from nine to eleven o'clock finds a large number of students in the dental library looking up authorities on their work. The library is also open every evening through the week. During the month of October there were about one hundred and seventy books and manuscripts drawn.

## BOOKS RECEIVED.

*Contribution a L'Etude, de L'Usure Dentaire.*—By Harry B. Respinger, D.E.D.G., D.D.S. This valuable contribution to dental literature will be of more than passing interest to the students and graduates of the University of Michigan when it is remembered that Dr. Respinger is a graduate of this institution, in the class of '95.

The only criticism that can be made of this work is, that for the average American dentist, it should be translated into the English language. It is very exhaustive, well illustrated, and shows great care in research and compilation.

Its ten chapters are divided as follows: I, Terminologie; II, Caractères histologiques de l'usure dentàire; III, Observations originales; IV, Résumé statistique de nos observations; V, Déscussion générale sur les causes de l'usure normale et des usures anormales; VI, Modifications, lésions et affections consécutives à l'usure dentaire; VII, Quelques idées nouvelles sur l'usure dentaire; VIII, De l'usure dentaire au point de vue de la détermination de l'age; IX, De l'usure dentaire au point de vue médico-légale; X, Conclusions.

*World's History and Review of Dentistry.*—By Herman Lennmalm, D. D. S. Coming to our table too late for notice in our last issue it seems almost superfluous to criticize at this late date. The title, it seems to us, is rather misleading, for there is very little of the history of dentistry to be found in its pages. As a compilation, however, of facts and data and of the laws governing the practice of dentistry in the various states of this country and of all foreign countries, it is a host in itself. The amount of useful information it contains can only be estimated by its careful perusal.

It comes from the press of the W. B. Conkey Company, Chicago, and should be found in the book case of every dental practitioner.

## ALUMNI NOTES.

W. A. Lampman, D.D.S., '95, was married to Miss Stella Heath, of Hastings, Michigan, September 10. Dr. Lampman has purchased the practice of Dr. S. M. Fowler, '88, of Hastings.

Dr. J. H. Billmeyer, Jr., '95, was seen about the college November 26.

A son was born to Dr. W. J. Mummery and wife, of Milford, Michigan, in November.

D. N. Swift, D. D. S., '94, of Buchanan, Michigan, visited about the college on November 21.

Paul Woolsey, D. D. S., '90, expects to graduate from the Detroit College of Medicine this year.

Dr. G. W. Collins, '94, of Vermillion, South Dakota, spent November 20 in this city, visiting friends.

B. H. Lee, D.D.S., '92, of Grand Rapids, was married August 27 to Miss Frances B. Slayton, of Hart, Michigan. Congratulations.

On the evening of November 27, Dr. M. T. Watson, '93, of Bay City, was married to Miss Genevieve Ryan, at the residence of the bride's parents, Ypsilanti, Michigan.

J. Austin Bucknall, D.D.S., '95, who is now practicing in Detroit, called at the college and on friends about October 20. Dr. Bucknall describes an interesting case in practice in this number of the JOURNAL.

Dr. Thomas H. Low,, of Boston, Massachusetts, visited friends in this city December 2a nd 3. Dr. Low was en-route to Denver, Colorado, where he has purchased the practice of Dr. R. de G. Treen, Tabor Opera House block.

At the first regular meeting of the Detroit Dental Society the following officers were elected: Drs. A. W. Diack, '92, president; C. H. Oakman, vice-president; A. W. Haidle, '92, secretary, and Will Cleland, '84, treasurer.

It is rumored that Fred Sizelan, D.D.S., '90, has sold his practice at Muskegon, Michigan, to Dr. S. M. Fowler, and that Dr. Sizelan will soon leave for London, England, to establish himself there. The JOURNAL wishes him every success.

Dr. Carrie M. Stewart, '92, who has been practicing in Texas the past two years, has recently located in our neighboring city, Ypsilanti. Miss Stewart was a member of the first Board of Editors of the JOURNAL, and its best wishes for success are hers.

A very painful accident occurred to Dr. G. M. Moore, '94, of Fond du Lac, Wisconsin, on November 16. The railing of a stairway in the rear of his office gave way, causing him to fall a distance of eighteen feet. He sustained a severe fracture of both ankles.

Dr. Homer E. Parshall, '88, of *Unter den Linden*, 58, Berlin, spent a few weeks in October at his old home, Pontiac, Michigan. Dr. Parshall was accompanied by his wife, who is a resident of Berlin. While in this country he spent a few days in Ann Arbor, calling on friends and visiting the college.

Professors R. B. Tuller and A. H. Peck, of the Chicago College of Dental Surgery; J. G. Reid, of the American College of Dental Surgery, and G. L. Field, of the Detroit College of Dental Surgery, visited the college and friends on November 15. They report an attendance of over 400 students at each of the colleges in Chicago and of about 75 at the Detroit College.

The following alumni were seen about the college and in the city on November 15 and 16: A. W. Diack, '92; W. C. Herbert, '89; H. Kreit, '93; A. H. Kessler, '94; H. C. Raymond, '88 and J. Lathrop, Jr., '94, of Detroit; W. C. McKinney, '94, of Saginaw; C. J. Hand, '84, of Romeo, and J. W. Jungman, '89, of Cleveland. Dr. C. H. Oakman, of Detroit, was also among the number.

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## DEPARTMENT NOTES.

W. Gray, '97, is at the Northwestern this year.

J. W. Lyons spent his Thanksgiving in Toledo.

C. H. Bailey, '96, passed the summer in Duluth.

J. M. Duffy, '98, is one of the foot ball reserves.

C. P. Bessmer, '96, is finishing his course at Detroit.

Miss Woodin, '98, is a daughter of R. M. Woodin, '96.

E. Janes, '97, has gone to Philadelphia to finish his course.

Miss Edith Phillips, '98, is a sister of C. A. Phillips, '96.

J. H. O'Toole, '96, passed his vacation in the office of Dr. Hall.

We were sorry to see A. J. Wildanger with one arm in a sling. Result of ball playing just before the opening of college.

There are sixty-four students registered in the Freshman class, E. J. Anderson.

Dr. Douglas Anderson, '95, has a brother in the Freshman class.

E. E. Sutphin, '97, is in Davenport, Iowa, in the office of Dr. Kelly.

C. E. Pease, '98, will do the solo work for the Glee Club this year.

J. W. Lyons, '96, has a brother, C. J. Lyons, in the Freshman class.

Miss Jessie Castle, '96, spent Thanksgiving at her home in Battle Creek.

T. M. Sheridan, '96, was at his home, Flushing, Michigan, during the summer.

The class in metallurgy commenced work under Dr. Dorrance Monday, October 28.

During the past year new locks have been put on the desks in the Freshman laboratory.

F. G. Powers spent a very pleasant summer vacation in Battle Creek with Dr. Phillips.

F. G. Powers has the finest chair in the operating room. It is a Columbia and is a beauty.

J. W. Miner, last year's Freshman editor of the JOURNAL, has given up the study of dentistry.

H. J. Livingston, '96, spent his Thanksgiving vacation with C. L. Kemery, '96, of Flint, Michigan.

There are six ladies in the department, one Senior, two Juniors and three in the Freshman class.

Germany sends one representative from across the ocean to the department in the person of Mr. Bröcking.

S. J. and S. A. Farnum were called home for a short time in October by the sickness of a younger brother.

C. L. Sherwood, '96, says he never expects to spend so pleasant a vacation as the one of the past summer.

Dr. E. F. Day is taking a p. g. course with the Senior class. Dr. Day is a graduate of the London Dental Hospital, England.

C. F. Fitch, '96, occupied his time during the past vacation in the office of Dr. West, of Jamestown, New York.

The Juniors and Freshmen can now work in the mechanical laboratory on Saturday forenoons from 9 until 12 o'clock.

G. H. Dennis, '97, was visiting friends in the city a few days about November 15. Mr. Dennis is in the Northwestern this year.

Dr. Haidle has full charge of the Freshman class in mechanical technique this year. Three Demonstrations each week are given the class.

F. J. Hale, from the Northwestern Dental College, and Mr. Smith, from the American, are among the new arrivals in the Senior class.

From a newspaper we clip the following: "Dr. Jennie M. Taylor has gone to Africa. The first woman dental missionary among women."

The same old cry from the Seniors for more light in the operating room. Those much-talked-of electric lights do not seem to have materialized.

Dr. Darling has shown the Seniors some very interesting cases at the hospital this year. The doctor is making his course in surgery very instructive.

The Dental Society and DENTAL JOURNAL have concluded to join hands and purchase a Land furnace for porcelain work to place in the college for the use of the students.

C. F. Steinbaur, '98, was a successful candidate for the 'Varsity Mandolin and Banjo Clubs. By the way there is some very good musical talent scattered through the department.

C. F. Fitch, '96, is on the Glee Club. The department is well represented this year, having two members on the Glee Club and C. F. Steinbaur, '98, on the Mandolin and Banjo Clubs.

The membership committee of the Dental Society has been canvassing the whole department for new members. The result is that there are thirty-two new names which were voted on at the last meeting. Every student of the department should become a member, as the papers and lectures delivered before the Society are of inestimable value to each student.

E. V. Deans, '96, passed his summer vacation at Newport, Rhode Island, where he held down a position in an office and also played ball. Mr. Deans is captain of the 'Varsity ball team for '96.

We are glad to see the smiling face of Herman Prinz again in the class of '96. Mr. Prinz has been in Germany since last spring, where he has been teaching some American ideas about dentistry.

The old soldering table in the mechanical laboratory is a thing of the past. During the summer vacation a new one was erected around the furnace. It is much more convenient than formerly.

The Junior dental class, together with the Freshman medical class, were shown some very interesting specimens of microörganisms in the hygienic laboratory Saturday morning, October 26.

While recuperating this summer G. F. Burke, '96, made a bicycle tour through Canada to Buffalo and from there back to Toledo along the North shore of Lake Erie and he says it was an ideal trip.

We are very sorry to chronicle the death of Frank L. Lee, '96. His death occurred July 20 at his home in Benton Harbor, Michigan. His classmates extend their sympathy to the bereaved family.

Owing to the large amount of work which the Juniors have this semester their demonstration hours have been changed from two to one hour each week and occurs now on Friday instead of Tuesdays and Thursdays.

At the first meeting of the Dental Society for the present year, which occurred October 14, the following officers were elected: President, C. F. Fitch, '96; vice-president, George H. Wooton, '96; secretary, Miss J. A. Burr, '97; treasurer, S. K. Scharlott, '97. The following committees were then appointed: Executive, J. P. Collett, '96; F. G. Powers, '96, and J. M. Rosenthal, '97. Membership, W. H. Buttolph, '96; Ralph L. Williams, '96; H. S. Buell, '96; D. W. Stoup, '97, and C. A. Phillips, '96. The retiring treasurer, S. S. Mummery, '96, and C. H. Bailey, '96, business manager of The Journal last year, submitted their reports, which were accepted.

The Seniors held their class meeting October 14, and the following officers were elected: J. W. Lyons, president; Miss Jessie Castle, vice-president; C. L. Sherwood, secretary, and James N. Clark, treasurer.

W. J. Stapish was called home November 9 by the death of his father, Mr. Joseph Stapish. His death resulted from a stroke of apoplexy. Mr. Stapish has the sympathy of his classmates in his bereavement.

Dr. Dorrance's clinic room has been furnished with a new chair, and a bay window has been added to the north side of the room, furnishing more light. It is now a very neat and convenient room for the accommodation of patients.

Just at present there seems to be a large number of hypnotists in the department. As yet we have not heard of any one having teeth filled or extracted without pain while under the influence of an operator who could hypnotize anybody.

The Freshman class meeting for election of officers was held in the amphitheater November 14. A. W. Chamberlain was chosen president; Miss Bessie Hutchinson, vice-president; D. W. Flint, secretary; R. J. Roper, treasurer, and J. F. Conley, marshall.

There is a rumor afloat that the operating room will be furnished with new chairs next year. Hope it is a rumor that has some truth in it. A college as well known as the University of Michigan ought to have some first-class chairs in its operating rooms.

Quite a discussion took place before the Dental Society at its last meeting, November 17, as to whether the diploma from this college should be written in Latin and the degree changed to D. M. D., or whether it should retain its present form and continue the D. D. S. degree.

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THE DENTAL JOURNAL.

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# EXOSTOSIS.*

BY A. W. DIACK, D. D. S., '92.

In writing a paper upon exostosis it seems that the only result obtainable is the freshening of previous but possibly forgotten knowledge, and while this is of itself apology enough for this paper, I would like to add a few remarks about the subject so that it may be presented in a new light.

When I first began to write concerning it I was merely to report a case which was exceedingly interesting to me, but owing to other circumstances I was asked to enlarge my report and present a paper covering the subject of Exostosis.

This pathological condition has been observed for a great number of years and, as the different observers were either men of classical, scientific or pedantic education, it has obtained many names as the years have gone by so that at the present time we have the words *Exostosis*, *Hyperostosis*, *Excementosis*, *Dental Osteoma* and *Hypercementosis*, all applied to this one condition. But this multiplicity of names is hardly to be wondered at when we consider the deficient and ineffective classification and nomenclature of dental science of the past and present. Perhaps we should rather be justified in wondering why we have not more names to add to the above list. So far as I am personally concerned, for scientific reasons I would prefer the term "Dental Osteoma" as being the proper descriptive term. As you all are more or less acquainted with this condition I will not enter into any detailed description of it. But in order to bring the facts plainly before us it might be well to hastily describe it.

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* Read before the Detroit Dental Society, January 11, 1896.

Exostosis, as we will call it, may be said to be merely an enlargement of the cementum of the root of a tooth. This enlargement may involve either the whole of the original cementum, in which case it is known as *diffused* exostosis or it may be found only on certain portions of the root, pushing itself out in different shapes such as nodular or pyramidal. This latter disease is known as the *circumscribed* exostosis.

This enlargement of the cementum is histologically and pathologically a pure hyperplasia, that is, it is due to an increase in the number of bone elements or cells in the cement, and, to all appearances, this new bone tissue is exactly the same as the normal cementum which is developed from the peridental membrane. The normal cementum is, however, produced at the time of tooth calcification, whereas the new growth, according to well known authorities, is never found in patients less than eighteen years of age. So that we are obliged to ascribe the secondary growth to the renewed activity of the peridental membrane due to causes which are practically unknown, although several theories have been advanced to account for it.

Histologically this secondary growth does not differ from the ordinary bone tissue except that Haversian systems are very rarely found, probably because of the manner and slow process of formation.

Now to look at some of the theories which are said to account for it. Among the many causes enumerated, we have mentioned caries, alveolar abscess, pulp irritation, irritation arising from large proximal fillings, deposition of salivary calculus, traumatic injury and mal-occlusion.

Of all these I think that hardly one deserves as much notice as is given it as the cause of exostosis, but would rather advance a new theory that seems to me to be more rational and based upon scientific facts, and, what is more, is the fac-simile of the theory regarding abnormal growths in other parts of the body. I believe that this condition is due to a derangement of the trophic nerves, if such there be, of the pericementum, such derangement being due to some constitutional cause which may also be hereditary.

As to the causation of the disease by caries the great number of teeth affected with exostosis and yet perfect so far as caries is concerned would, I think, eliminate caries as one of the causes, as it would also pulp irritation and large fillings. Alveolar abscess is hardly to be considered as a cause because of the rarity with which it is found in this condition. As to irritation arising from large proximal fillings, whose edges have not been smoothly finished and the deposition of salivary calculus while we often find them coincident with exostosis, I am of the opinion that the presence of these irritants would rather tend to cause the death of the peridental membrane than to stimulate to an increased and long since ended activity. The necrosis of this membrane from these irritants is an every-day occurrence.

It is also generally held that mal-occlusion is the one cause which gives rise to this condition of exostosis and with great reason too; that is, from a cursory glance at the facts. But before accepting this as a cause it would be well to take into consideration the facts concerning the growth of both the cementum and the alveolar process surrounding the tooth, the situation and size of the exostosis, and when we have done that I think that the grounds upon which mal-occlusion is said to be a cause of exostosis will be found to be untenable.

It is said that mal-occlusion produces an irritation of the peri-cementum, causing it to renew the growth of the cementum. Why should it not also be stimulated to increase the growth of the process by the same cause and thus instead of having an increase in size of the root and an absorption of the process we would, if this theory were true, have an increase in size of both the process and root, as the irritation is equal and to all definite knowledge the same?

Then, too, the circumscribed form. How can we account for the fact that very often the growth will be upon the surfaces, the sides, on which we naturally would think the irritation would be least? So much for that theory. Now, from a view of all the phenomena which accompany this abnormal growth, namely, the secondary activity of the peridental membrane, the age at which this growth occurs; the teeth which it attacks, irrespective of decay or external disease, the presence of the circumscribed variety and, above all, the observance of the influences of heredity upon its appearance, we must come to the conclusion that it is due to a cause far remote from any local disturbance, although such disturbance may become a factor in the growth of the exostosis. In point of fact this pathological condition simulates nothing so much as it does the appearance of bony tumors or osteoma in other parts of the human organism such as the exostosis which appear in the auditory meatus and also the nodular bony growth upon the skull and similar growths upon the bony skeleton which are met with in general surgery. It is time that they are more or less associated with traces of syphilitic affections or the gouty diathesis, but is it not also a fact that we find this condition more frequently in those patients who are of the so-called gouty diathesis?

And then is it not a fact that corresponding bones or parts of the body on each side will be affected by this process? Eminent surgeons thus describe the exostosis of long bones, and in the case which follows I think that the facts seem to point to a similar affection of the corresponding second bicuspids: Miss A, presented June 20th at office, complaining of pain in right side of' face. Face and cheek on that side were puffy and inflamed in appearance. Condition was increased by noise or any sudden shock. Pain was also very great at the back of head.

History of case showed nothing definite. Had been treated by physicians for two years but with no satisfactory results. They ascribed the condition to some disorder of liver or digestion. Teeth had been examined but no cavities had been found, nor, indeed, any cause for the trouble, but as the patient had some years previously suffered from a severe neuralgia on left side and had been relieved by the extraction of two bicuspids, she, in desperation, determined to have some extraction done on right side, more as an experiment than anything else. It was in that frame of mind that she presented herself to me, and from her condition of suffering I was perfectly willing to sacrifice any or all of her teeth if there was any chance of giving relief.

But upon examination I failed to find any condition which might give rise to this state of affairs, keeping well in mind the diseases of the antrum and the relations of the teeth to inflammations of that cavity.

She complained of sensitive dentine in the neighborhood of the bicuspids but instruments failed in finding any cavity. However, at the first sitting I painted the gums from central incisor to third molar with a mixture of equal parts of chloroform, aconite and iodine, and told her to paint gums with iodine and report next day, which she did, and much to my susprise reported great relief.

She was obliged to leave town for the summer and so I saw nothing of her until the first week in October, when she again called and reported that for a long while the iodine applications were efficient but had lately been powerless, so that she was suffering worse than ever, and she wished me to take out all the upper teeth on the affected side. I objected, but promised to do so if she would wait a few days so that I might determine if any special tooth was the cause of the trouble.

Remembering the sensitive dentine I wedged the bicuspids apart by means of cotton, not wishing to use the separator on account of the pain and irritation. In two days I was able to examine the space between them and found in the second bicuspid a small area of dentine not more than one sixteenth of an inch square, which was extremely sensitive, but only when the instrument was passed over it in a certain direction. The patient was thoroughly determined upon extraction, and upon my advice I extracted the second bicuspid after very much difficulty because of the exostosis. I then extracted the first bicuspid on account of pain in it at the time, so that I am enabled to show you the two roots and the difference in the size.

Since extraction she has reported twice and I am happy to say there is a decided improvement. Swelling and pain have subsided greatly and patient feels very hopeful. Have not seen the case for two weeks.

While I have no decided opinion on the relations of these facts I am inclined to think that this exostosed bicuspid was the cause of her trouble, the pain being the direct result of irritation and the swelling of the cheek due to reflex irritation of vasomotor nerves of the parts.

## DISCUSSION.

**Dr. W. H. Dorrance:** I believe mal-occlusion to be a predisposing cause of exostosis, and believe also that it is due to mal-nutrition. Mal-nutrition is a condition brought about by impaired function of the small intestine. My physician in New York who treated me last summer for my ailment, believes that many of the organic diseases are a result of mal-nutrition. When the proper support of the arch has been lost, an irritation follows, which may cause exostosis. An improper or excessive use of a tooth may cause it, such as the cracking of nuts, etc.

**Dr. Jas. Cleland:** Within the past six or eight months I have had a lady of perhaps forty years of age under my care, who was unable to digest even the most simple food. The teeth were very sensitive and were decaying very rapidly. I finally began extracting one after the other and found all of them very much exostosed, particularly the lower incisors. There was also a condition of excessive redness in the face. Extraction naturally brought relief.

**Dr. F. W. Cryderman:** I should like to ask Dr. Dorrance what he means by mal-nutrition?

**Dr. W. H. Dorrance:** It is a condition where any special part, or, perhaps all parts, fail to receive a proper supply of nutrition. The supply may be either excessive or insufficient.

**Dr. A. W. Haidle:** If this condition of exostosis can be ascribed to a faulty action of trophic nerves, as the essayist claims, then, it seems to me, physiologists have a proof of the presence of trophic nerves, a matter which, at the present time, seems to be one of question. The theory, it seems to me, is exceedingly good. While the term *dental osteoma* appears to be a good one, I think it might be laid aside until such time as our present heterogeneous dental nomenclature can be revised.

**Dr. J. M. Thompson:** In looking over some notes and in reading up on this subject, I find that persons of weak constitutions are most apt to present this condition. Mal-occlusion appears to be its chief cause, and it is found most frequently in the anterior teeth.

**Dr. H. C. Raymond:** What concerns us chiefly is how to diagnose exostosis and not what causes it. An abscess cannot be the cause, as some claim, and it is very difficult of diagnosis until after extraction. I have found an electric mouth lamp very serviceable, and particularly in the anterior teeth, where an exostosed tooth may sometimes be diagnosed with its aid.

**Dr. A. W. Diack:** Dr. Dorrance claims that exostosis is caused by mal-occlusion. I affirm that it is a growth similar to cancerous growths, which we believe are due to mal-nutrition, or, to put it in other words, to a faulty function of the trophic nerves. That it is analogous to cancerous growths is proved by the presence of the circumscribed form.

# FOOD-STUFFS: THEIR RELATION TO DENTAL CARIES.*

BY ALLISON WILLIAM HAIDLE, D. D. S., '92.

PHYSIOLOGICAL chemists divide food-stuffs into five great classes: Proteids, carbohydrates, fats, salts and water.

*Proteids* are again divided into seven classes, those in Class I, spoken of as native albumins, comprise the egg and serum albumins; Class II, the derived albumins, acid and alkali albumins, syntonin and casein; Class III, the globulins, crystallin, vitellin, paraglobulin, fibrinogen, myosin and globin; Class IV, the fibrins; Class V, the coagulated proteids; Class VI, the albumoses and peptones, and Class VII, lardaceïn, or amyloid substances.

The *carbohydrates* are starches and sugars in their various forms and the *fats*, olein, stearin and palmatin.

Proteids are distinguished in their chemical composition, from carbohydrates, in that they contain besides the C, O and H molecule, N and sometimes S.

What, now, is the relation these various food-stuffs bear to dental caries?

Miller, in his "Microörganisms of the Human Mouth," describes dental caries as "a chemico-parasitical process, consisting of two stages, decalcification, or softening of the tissue, and dissolution of the softened residue."

The chemico-parasitical process is simply a splitting up of sugars into lactic acid by a lactic acid ferment, which is in turn produced by the bacterium acidi lactici. The lactic acid thus formed decalcifies the tooth substance and the remaining softened, albuminous material is liquified by other germs of the mouth.

From over two hundred experiments with human saliva, made by Miller regarding the formation of acids from various foods, the following results in acid units were obtained, the "acid unit" signifying that quantity of acid necessary to neutralize 0.1 cubic centimeter of a 0.5 per cent. solution of caustic potash:

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* Read before the Detroit Dental Society, February 8, 1896.

| MATERIAL. | DURATION OF EXPERIMENT. | ACID FORMED IN ACID UNITS. |
|---|---|---|
| Bread (dry) | 12 and 30 hours | 22 and 72 |
| Starch | 12 " 30 " | 20 " 42 |
| Cane-sugar | 12 " 30 " | 17 " 37 |
| Grape-sugar | 12 " 30 " | 19 " 40 |
| Potato (boiled) | 12 " 30 " | 24 " 75 |
| Corn (in milk) | 12 " 30 " | 24 " 77 |
| Bread (1.0 g.) | 12 " 30 " | 35 " 110 |
| Sugar (2.0 g.) | 12 " 30 " | 20 " 41 |
| Rice | 12 " 30 " | 25 " 72 |
| Macaroni | 12 " 30 " | 20 " 76 |
| Meat | 12 " 30 " | 0 "*—3 |
| Meat (raw) | 12 " 30 " | — " —5 |
| Fish | 12 " 30 " | 0 " —5 |
| Eggs | 12 " 30 " | 0 " — |
| Cheese | 12 " 30 " | 0 " (?) |
| Spinach (in water) | 12 " 30 " | 0 " 0 |
| Potato (raw) | 12 " 30 " | 0 " 0 |
| Salad (raw) | 12 " 30 " | 0 " 0 |
| Fat | 12 " 30 " | 0 " (?) |

* The sign — denotes an alkaline reaction.

In all but two of these experiments 4.0 cubic centimeters of saliva was used to 0.5 g. of the food tested.

It will be seen from this table that the carbohydrates are the acid-forming foods, and that, therefore, the proteids have little or nothing to do with dental caries. It will also be noticed that raw vegetable foods are less fermentable than cooked, and sugars less than starchy foods.

When starches remain for a short time in a mixture with saliva, the following reactions take place:

$$\text{Starch}+\text{Ptyalin}=\begin{cases}\text{Erythro-dextrin}=\begin{cases}\text{Maltose,}\\ \text{some Dextrose (glucose).}\end{cases}\\ \text{Achroo-dextrin}=\begin{cases}\text{the same products, but}\\ \text{with difficulty changed.}\end{cases}\end{cases}$$

These sugars, maltose and dextrose (glucose)—classed among the grape-sugars—are split up by the lactic acid ferment into lactic acid, according to the equation: $C_6 H_{12} O_6 = 2 C_3 H_6 O_3$. Cane sugar (saccharose) on the other hand "becomes fermentable only after hydratization," as follows: $C_{12} H_{22} O_{11} + H_2 O = 2 C_6 H_{12} O_6 = 4 C_3 H_6 O_3$.

The question is often asked, What effect has candy on decay of the teeth? Much care is given at the present time in the manufacture of candies, the chief sugars used being glucose, a grape sugar, and saccharose or cane sugar. Both of these sugars may be absorbed by the mucous membrane of the mouth, and no doubt are, when in contact with that membrane. Should they, however, find a resting place in the deep fissures of the teeth they will be directly converted into lactic acid, and decalcification of the enamel results.

While the eating of candies may therefore endanger the integrity of the tooth, the lodgement and consequent fermentation of starchy foods is far more injurious.

The following analysis of foods by Vaughan, giving the percentage of proteid, carbohydrate and fat in each, may be of interest:

| FOOD. | PROTEIDS. | CARBOHYDRATES. | FATS. | WATER. |
|---|---|---|---|---|
| Beef, fat | 17. % | | 26.5% | 55.5% |
| Beef, medium | 21. | | 5.5 | 72.5 |
| Beef, lean | 21. | | 1.5 | 76.5 |
| Veal, fat | 19. | | 7.5 | 72.5 |
| Veal, lean | 20. | | 1, | 78. |
| Mutton, fat | 15. | | 36. | 48. |
| Mutton, medium | 17. | | 6. | 76. |
| Pork, fat | 14.5 | | 37.5 | 47. |
| Pork, lean | 20. | | 7. | 72. |
| Rabbit | 21.5 | | 10. | 67.5 |
| Goose | 16. | | 45.5 | 38. |
| Poultry | 20. | | 4. | 75. |
| Game | 22.5 | | 1. | 75.5 |
| Tongue | 14.5 | | 17. | 67.5 |
| Heart | 18. | | 8. | 73. |
| Blood | 18. | | 0.2 | 81. |
| Kidneys | 18.5 | | 4. | 74.5 |
| Liver | 20. | | 4. | 74.5 |
| Salmon | 16. | | 6.5 | 76.5 |
| Salmon, smoked | 24.2 | | 12.3 | 51.5 |
| Stock fish | 80. | | 1. | 17.5 |
| Eel | 13. | | 28.5 | 37.5 |
| Caviar | 31.5 | | 16. | 43.5 |
| Blood sausages | 12. | 25. % | 11.5 | 49.5 |
| Liver " | 16. | 6.5 | 26.5 | 48.5 |
| Pork " | 16. | 29.5 | 39.5 | 6. |
| Rice | 8. | 76.5 | 1. | 13. |
| Wheat, fine | 10. | 75.8 | 1. | 13. |
| Wheat, coarse | 12. | 71.5 | 1.5 | 13. |
| Oatmeal | 14.5 | 65. | 6. | 10. |
| Buckwheat | 9.5 | 72.5 | 2. | 13. |
| Wheat bread, fine | 7. | 55.2 | 0.5 | 36. |
| Wheat bread, coarse | 6. | 51.9 | 0.5 | 40. |
| Potatoes | 2. | 20.7 | | 75.5 |
| Cabbage | 2.5 | 6.5 | 0.5 | 88. |
| Garden beans | 5.5 | 7. | 0.5 | 84. |
| Green peas | 6.4 | 12.1 | 0.5 | 78. |
| Fresh fruit | 0.5 | 10. | | 85. |
| Dried fruit | 2.5 | 55. | 1. | 30. |
| Eggs | 12.5 | | 12. | 74.5 |
| Cow's milk, fresh | 3.4 | 4.8 | 3.6 | 87.5 |
| Cow's milk, skimmed | 3.1 | 4.8 | 0.7 | 90.7 |
| Butter | 0.6 | 0.6 | 83.3 | 14.5 |
| Cheese | 25. | 2.2 | 29. | 39.5 |

## DISCUSSION.

**Dr. Jas. Cleland**: The elaborate paper we have just listened to gives us a very correct analysis and tests for the alkalies and acids of our food-stuffs. But it is necessary that we should know more than we do on this subject. The civilized world is suffering from a disease that is attacking alike the rich and poor of all classes, a disease which was, to a limited extent, known to the ancients and which has grown in severity with the increase of population and civilization. Animal life must draw its nourishment from sources containing in sufficient quantity their physical constituents. As animals, we develop and subsist solely upon such substances as are taken into the body by way of the mouth as foods. It is plain that food must contain in definite proportions precisely the chemical elements of which our bodies are composed, or perfect development is impossible. A child deprived of lime phosphates in its food has rickets, loss of teeth, etc., etc. An adult eating an excess of starch in the form of white flour, has rheumatism, gout, and loses his teeth early in spite of most skilled dentistry. The dentist, possessing superior knowledge of the teeth, should instruct his patients as to the best means of preserving them by dietary, principals of prevention, etc. Prominent among all destructive foods is common white flour which, with its one chief nutriment, starch, is made into a variety of foods, which as a fact all come from the same barrel. The whole kernel of wheat contains all of the fifteen elements of which the human body is composed and in about the same proportions, and for this reason it may be called the natural food of man. My experience dates back many years. While a boy I lived for a year on my uncle's farm in Scotland and the food of the laborers there was chiefly oatmeal, still these people were never troubled with decay of the teeth. At a dinner a famous Englishman once proposed the toast "Here's to Oats, which Englishmen feed their horses and the Scotch their men." A witty Scot replied "Yes, and where do you find such horses and such men."

**Dr. H. C. Raymond**: Not long since I had occasion to ask a mother what foods she allowed her little daughter to eat. The teeth of the child were very badly decayed. The mother replied that she fed her children a great deal of malted milk. Whether this was the cause of decay or merely a coincidence I am unable to say. Prepared foods are, I think, very unhealthful, not only to the teeth but to the whole digestive system. Teeth should be exercised as well as other organs. Meats, however, cause an acid condition of the blood, and many a case of pyorrhœa and gout has been bettered by a discontinuation of their use.

**Dr. A. W. Diack**: I think there is much less harm done the teeth from eating candies than from eating starchy foods and from neglect to properly care for them.

**Dr. C. H. Oakman**: Dr. Raymond speaks of acids being formed in the stomach from meats. I have been troubled in that way myself. I called on a specialist who prescribed potassium bicarbonate and restricted my diet to purely carbohydrate foods. This immediately produced alkalinity of the blood and I have felt much improved in health since that time. I am troubled with no more neuralgia of the heart or with muscular rheumatism. I have frequently been asked for advice regarding care of children's teeth. I recommend brush and powder, eating of rye or other hard bread, and chewing of spruce gum. I prefer the spruce gum as it causes more friction and cleanses the teeth much better.

**Dr. F. W. Cryderman**: Mastication is good for the teeth. I believe that powerful acids are developed in the stomach and in the mouth as well. I advise the use of lime water. I once read of the use of creosotum (twelfth dilution) as being of use in these conditions. I tried it and found it excellent and always advise the use of it for my patients.

**Dr. A. W. Haidle**: I have lately learned that the teeth of candy makers are, as a rule, poor. They attribute this, however, to the use of acids in the candy, many of the weaker acids being used in their manufacture.

## CLEANING AND BLEACHING OF BONES.*

BY H. H. LAUDERDALE, D. D. S., '95.

To the student in human and comparative odontology there is perhaps nothing which adds more to the value of a perfect and typical set of teeth than to see them in a skull well cleaned and bleached. A skull, dark, greasy, discolored or weather-beaten, offends the vision of one accustomed only to those of perfect whiteness, as does a poorly finished plate or filling that of the skilled operator.

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* Read before the Dental Society, January 7, 1894.

As no dental education is complete without a study of odontology, perhaps a few hints as to the way to best prepare skulls and bones may prove acceptable, especially to those who wish at some time to possess a collection of skulls.

A skull in the flesh or one which, though dry, has been properly roughed out and dried will always make the best specimen.

Roughing out, as the natural science collector would term it, is removing the skin and the major portion of the flesh from the skull. Care should be taken when working on the under side of the skull not to injure the often long and delicate styloid, hamular and other processes.

With a flattened instrument, slightly bent at one end, remove all the brain substance possible. Place the roughed-out skull in a bucket of cold water, changing the water daily until it is no longer bloody. If it is not convenient to macerate the skull at this time take it from the water and place it in a shady place to dry. It can then be kept as long as desired and will have little or no odor. On the collecting grounds the skulls are treated in this way and can then be shipped to any point in safety.

Roughed out ligamentary skeletons—the skeletons of all smaller animals, reptiles and birds are of this kind—are soaked in an aqueous solution of arsenic for fifteen minutes to protect them from the ravages of insects which would otherwise destroy the ligaments by which the bones are held together when mounted. Skulls, of course, do not need this treatment. Skulls should never be buried in the soil or boiled in water to remove the flesh, as either method tends to set the blood in the bones and leave them dark and discolored. Placing them in an ant-hill and allowing the ants to remove the flesh will produce the same effect. Skulls exposed for a long time to the weather become dark and can rarely be whitened.

Place the bucket containing the roughed-out specimens in a warm place, and, in summer, which is the best time to macerate, place in a sunny location, filling the bucket as the water evaporates. In winter a covered crock in a warm, sheltered nook will do, though the maceration process will be much slower. In Milan, Italy, where large numbers of skeletons are macerated yearly, pieces of horseflesh are thrown in the macerating tubs to hasten the decomposition. The time of maceration varies, being best in summer, slower in winter, fresh skulls in this climate in the summer requiring from six to eight weeks. When the skull has macerated sufficiently remove it from the bucket and scrub it in clean water with a stiff brush until thoroughly cleansed. A scraper is often of great service in cleaning the skull cavity.

Now take two gallons of water, bring it to the boiling point and add first two pounds of washing soda and then one pound of chloride of lime. Then, with a brush, wash the skull in this solution, commonly called Javelle water. The washing soda assists in removing the grease from the skull, while the chloride of lime bleaches the bones by means of the chlorine liberated. The length of time the skull is washed in this solution will depend on the strength of the solution and quality of the bone, strong, hard bones not being easily affected, while a delicate bone, left long in the solution, ceases to exist in its original form.

After washing the skull in Javelle water the proper length of time, rinse thoroughly in clean water to remove any of the lime which may have been deposited, and which, on drying, fills the small pits of the bone, giving it an unnatural, chalky appearance. Place the skull in the sunshine, when it soon becomes white. If, after two or three days, it is not as white as desired, again wash in Javelle water. If the skull shows signs of grease place it in a glass jar containing naphtha and allow it to remain in the sunshine, the jar to be covered with a glass plate to prevent the readily volatilized liquid from vaporizing. The skulls are placed in the sunshine as the warmth assists the action of the naphtha. The time needed to properly degrease skulls depends considerably on their size, the smaller ones being degreased more rapidly than a relatively larger skull. For small skeletons and skulls about two months would be the average length of time required.

After removing from the naphtha again wash the bones in the Javelle solution, rinse in water and again place in the sun to bleach. In many fresh skulls the bones show little or no signs of grease, and do not need this treatment, and in large skulls and skeletons a special machine is needed, which, though doing the work quicker and using a much smaller amount of naphtha, is much more likely to injure the bones.

The bones from the dissecting room if strongly injected seldom bleach perfectly, just why I cannot tell, the arsenic with which the subjects are injected being, no doubt, the cause. Bones of this sort often remain in maceration for a year and a half and then are very hard to clean, while fresh specimens would be fully cleaned in one-fourth of that time.

In macerating skulls great care should be taken to prevent any brass or iron getting into the water, as the brass renders the bones of a greenish hue, which, as yet, nothing has been found that will remove. The iron rusts the bones, and then they must be scrubbed in hot hydrochloric acid, washed in Javelle fluid, rinsed in clean water and bleached.

## CODE OF DENTAL ETHICS.*

### ARTICLE I.

### THE DUTIES OF THE PROFESSION TO THEIR PATIENTS.

SECTION 1. The dentist should be ever ready to respond to the wants of his patrons, and should fully recognize the obligations involved in the discharge of his duties toward them. As they are, in most cases, unable to correctly estimate the character of his operations, his own sense of right must guarantee faithfulness in their performance. His manner should be firm, yet kind and sympathizing, so as to gain the respect and confidence of his patients; and even the simplest case committed to his care should receive that attention which is due to any operation performed on living, sensitive tissue.

SEC. 2. It is not to be expected that the patient will possess a very extended or a very accurate knowledge of professional matters. The dentist should make due allowance for this, patiently explaining many things which may seem quite clear to himself, thus endeavoring to educate the public mind so that it will properly appreciate the beneficent efforts of our profession. He should encourage no false hopes by promising success where, in the nature of the case, there is uncertainty.

SEC. 3. The dentist should be temperate in all things, keeping both mind and body in the best possible health, that his patients may have the benefit of that clearness of judgment and skill which is their right.

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*Adopted by the American Dental Association, August, 1866.

## ARTICLE II.

### MAINTAINING PROFESSIONAL CHARACTER.

Sec. 1. A member of the dental profession is bound to maintain its honor, and to labor earnestly to extend its sphere of usefulness. He should avoid anything in language and conduct calculated to discredit or dishonor his profession, and should ever manifest a due respect for his brethren. The young should show special respect to their seniors; the aged special encouragement to their juniors.

Sec. 2. The person and office arrangements of the dentist should indicate that he is a gentleman; and he should sustain a high toned moral character.

Sec. 3. It is unprofessional to resort to public advertisements, such as cards, handbills, posters, or signs calling attention to peculiar styles of work, prices for services, special modes of operating, or to claim superiority over neighboring practitioners; to publish reports of cases, or certificates in the public prints; to go from house to house soliciting or performing operations; to circulate or recommend nostrums, or to perform any other similar acts. But nothing in this section shall be so construed as to imply that it is unprofessional for dentists to announce in the public prints, or by card, simply their names, occupation, and place of business; or in the same manner to announce their removal, absence from, or return to business; or to issue, to their patients, appointment cards having a fee bill for professional services thereon.

Sec. 4. When consulted by the patient of another practitioner, the dentist should guard against inquiries or hints disparaging to the family dentist, or calculated to weaken the patient's confidence in him; and if the interests of the patient will not be endangered thereby, the case should be temporarily treated, and referred back to the family dentist.

Sec. 5. When general rules shall have been adopted by members of the profession practicing in the same localities, in relation to fees, it is unprofessional and dishonorable to depart from these rules, except when variation of circumstances requires it. And it is ever to be regarded as unprofessional to warrant operations or work as an inducement to patronage.

## ARTICLE III.

### THE RELATIVE DUTIES OF DENTISTS AND PHYSICIANS.

Dental surgery is a specialty in medical science. Physicians and dentists should both bear this in mind. The dentist is professionally limited to diseases of the dental organs and the mouth. With these he should be more familiar than the general practitioner is expected to be; and while he recognizes the superiority of the physician in regard to diseases of the general system, the latter is under equal obligations to respect his higher attainments in his specialty. Where this principle governs, there can be no conflict, or even diversity, of professional interests.

## ARTICLE IV.

### THE MUTUAL DUTIES OF THE PROFESSION AND THE PUBLIC.

Dentists are frequent witnesses, and at the same time the best judges, of the imposition perpetrated by quacks, and it is their duty to enlighten and warn the public in regard to them. For this and the many other benefits conferred by the competent and honorable dentist, the profession is entitled to the confidence and respect of the public, who should always discriminate in favor of the true man of science and integrity, and against the empiric and imposter. The public has no right to tax the time and talents of the profession in examinations, prescriptions, or in any way, without proper remuneration.

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# OBTUNDING AGENTS FOR SENSITIVE DENTINE.*

BY C. H. BAILEY, '96.

SINCE the era of modern dentistry much has been said and written concerning the obtunding of sensitive dentine. That the subject is of vital importance is demonstrated by the large number of nostrums and secret preparations on the market for this purpose and the eagerness with which a certain class of dentists purchase and advertise their ability to perform painless dentistry with these too frequently dangerous concoctions. If the excavating of a cavity could be made entirely painless the bank books of hundreds of dentists would undoubtedly show a larger balance on the right side, for the reluctance of the majority of people to having their teeth properly cared for is due to the fear of pain.

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*Read before the Dental Society, November 1, 1895.

Before going into the discussion of the drugs used as obtunding agents in sensitive dentine perhaps it would be pertinent to review the histology of the tooth. We are all aware that throughout the dentine, running at right angles to the long axis of the tooth, are the dentinal tubuli, connecting with the pulp cavity. It has been demonstrated that the tubuli are lined by a very delicate but tough membrane, and that the periphery of the pulp cavity is lined by a layer of odontoblasts. Whether the dentinal tubuli are filled with minute nerve fibres or with the modified processes of the odontoblasts is still an open question, though the latter is the accepted view. That protoplasm has the power of transmitting impulses can easily be demonstrated. Take, for example, an amœba, a single cell, but one which has the characteristics of life, sensation to heat, pain, etc., for if a lively amœba be exposed to a temperature lower than the one necessary for his best living, his activity is lessened, and vice versa if the temperature be raised, up to a certain degree. Place an amœba in chloride of zinc or carbolic acid and it is coagulated, and, as the contents of the dentinal tubuli are identical in composition with these minute organisms, these drugs would have the same effect if applied to the dentine; they would coagulate the protoplasm in the tubuli. While the susceptibility to pain would be decreased with the destruction of these protoplasmic processes, as there would be nothing to transmit the pain, the pulp would also be endangered. Arsenic would be a perfect agent in obtunding sensitive dentine, were it not that here again we meet with the same objection, that the life of the pulp would, in all probability, be destroyed.

In a paper read before the Columbian Dental Congress, Dr. W. C. Davis, of Lincoln, Nebraska, said:

"In view of the fact that we know the cause of the irritation and the medium by which it is transmitted, and as this medium is not composed of nerve tissue, and as its destruction is not permissible, nor its coagulation, owing to the jeopardy of the pulp, it is my theory that the only means by which the dentine will ever be rendered insensible to the surgeon's instruments is by the removal of the protoplasm from the dentinal tubuli. This would of itself be sufficient, were it not for the fact that the dentine is hygroscopic—capable again of taking up moisture; from within by capillary attraction, from without by contact with the atmosphere.

"It is, therefore, my theory that after the extraction of the protoplasm we should deposit in its place another substance which is not in itself capable of transmitting sensation. The best means of extracting the protoplasm is the application of some agent not in itself injurious to the dentine or pulp, but which has a great affinity for moisture, of which protoplasm is very largely composed. Absolute alcohol is at once suggested. To assist its chemical affinity for moisture it had best be applied warm, as heat assists chemical action and also favors evaporation.

"If hot air is then applied, it will thoroughly vaporize the alcohol, carrying away the moisture it has extracted from the tubuli, leaving them empty. To whatever distance they have been emptied, to that distance we have destroyed the medium for transmitting pain. In other words we have obtunded the sensibility of the dentine. The next step is to fill the tubuli with some other substance. I fill the tubuli with a resinous gum in suspension in a volatile oil. Almost any one of the essential oils will answer the purpose, as they are composed of volatile oils and the resinous oils which we need. Probably nothing works better than oil of cassia, as upon the application of hot air the oils are easily volatilized, and if it has been diluted slightly with alcohol it will readily go into the tubuli as far as they are empty, leaving its gum to fill the space. To this distance you can excavate with impunity; consequently the success of the operation will depend upon the thoroughness with which you extract the protoplasm. In teeth of some structure it seems to be readily extracted to a considerable depth; in others it is next to impossible. I do not think the failure of this method in some cases is due to any mere structure or nerve complication, or nervous idiosyncrasies of the patient, but rather to the anatomical structure of each individual tooth and each individual cavity. For I sometimes find cavities in the same teeth, perhaps one on either side, seemingly the same distance from the pulp. In one it works perfectly; in the other it is extremely difficult to operate, sometimes meeting with no success. At the same sitting I will find a difference in different teeth in the same mouth. You may ask what I consider the difference in the anatomical structure, which would cause such a variance in the result of our attempts to extract the protoplasm, and I would say that our failure would be due to the relation of each tubule to its neighbor and partially to the size of the tubuli. Also where the tubuli are filled to quite a depth with the products of fermentation and micro-organisms, as alcohol does not have a great affinity for these ferments; consequently they would not be taken up so readily, as where the tubuli are filled with unadulterated, healthy protoplasm?"

Another agent advocated in the obtunding of sensitive dentine is the inhalation of ether. The patient usually holds the napkin or cone, upon which but a very few drops of ether are placed, and inhales until the first effects of anæsthesia are produced, stopping short of unconsciousness. The odor is an objection, of course, and while it is probably not used by many dentists, one eminent practitioner gives to this remedy the title of "King of Remedies."

Cocaine is a drug in common use by the profession to-day, though probably more as a local anæsthetic for the extraction of teeth than as an agent in allaying pain during an operation. But after once testing its efficacy as an obtunder no dentist is willing to have the magic crystals absent from his medicine case. That the drug has fallen into disrepute with many dental surgeons is undoubtedly true, but aversion to the use of this remedy on the part of many practitioners is probably due to the notoriety the drug has attained by the methods of unscrupulous and irresponsible men in the profession. It stands to day, however, pre-eminently the remedy for obtunding sensitive dentine. Its modus operandi is as follows: After the cavity has been made as dry as possible with the use of hot air, the raised temperature and dehydration of the tubuli not only lessening sensibility, but also providing for the absorption of any medicant placed in the cavity, the cocaine is applied in solution in chloroform. The only obstacle to its application in and around the teeth is the difficulty of securing absorption. If you can once cause it to reach the spot where you wish it to act it will anæsthetize every time it is applied.

A purely mechanical method used by many operators is the use of sharp excavators to quickly remove the generally small area of hyper-sensitive dentine, under this layer the dentine being usually normal in response to sensations from without. The rapid rotating of a small, highly-polished burnisher over the walls of the cavity will many times obtund the sensitiveness so that the operation can be continued with the maximum of comfort to both patient and operator.

In conclusion let me say that in those cases where it is undesirable to proceed with the operation, owing to the delicate health, nervousness of the patient, etc., probably the best method is to seal powdered tannin in the cavity, when, in a few days, it will be found that the tooth can be thoroughly excavated without those sensations of exquisite pain which make the dental office a place to be shunned until the last resource of those in need of the dentist's services is exhausted.

## THE LITERARY PHASE OF DENTISTRY.

The volume of literary matter representing the aggregate annual output in the field of dentistry is sufficient to convince any one that there is no present lack of writers or subjects upon which to write. When, however, the product is critically examined, and that which possesses real value is sifted from what is of doubtful merit, the need for improvement in the general average character of our literature becomes evident.

The improvement needed relates to at least two qualities in our literature: first, the nature of the matter which forms the subject; and second, the method of its presentation as literature—its literary dress, so to speak. More care as to these two features would eliminate from our literature in all of its departments much that is worse than useless, so far as any substantial benefit to dentistry is concerned, and would increase the value of that which really possesses intrinsic merit, by rendering it more attractive and more easily assimilated by the profession.

There is no lack of strong reasons why the literary tendency among practitioners of dentistry should be persistently cultivated. The benefits resulting from such a course affect both the profession as a profession and its members as individuals.

The cultivation of the literary tendency by the dentist, at least so far as it pertains to his profession, is one of the surest roads to success. This, we believe, is a fact which can scarcely be doubted.

By the literary tendency of the dentist in this connection is meant the ability to clearly and accurately describe whatever ideas he may possess that will add to the total of dental knowledge. This also necessarily implies the willingness to do so.

It may be well to define what is here meant by success. While we would not discredit the legitimate effort to achieve success in the acquisition of wealth or things having material value, it was long ago shown and is everywhere and constantly seen that these things of themselves do not bring a full compensation in happiness for the labor expended in their attainment.

Real success—that which endures to the end, and makes life a thing of beauty—is the resultant of certain motives and tendencies that have their foundations deeply laid in the individual character. First and most important of these essentials is the desire and ability to aid our fellows in developing to a higher plane of living, to impart to others something of what we ourselves may possess, that they may be benefited thereby. Life furnishes unlimited possibilities for the practical application of this principle. Its relation to the literary tendency in dentistry is perfectly plain, and when conscientiously applied does bring its full measure of the kind of success to which we have alluded. It does more than this. Neither professions nor corporations are as soulless as the disgruntled ones and malcontents would have us believe. The material success which is due to a man in compensation for labor well performed is as certain to come to him in just measure as a result of the appreciation of his colleagues, as is the success which he achieves within himself through the consciousness of having done well.

As to the effect of an improvement in our literary product, so far as the profession of dentistry is concerned, there can be no doubt. A tree is judged by its fruits. The thought of the profession is crystallized in its literature, and our status, as compared with other departments of life, is measured by the standard of our relative intellectuality. When we improve that, we in the same degree elevate dentistry.

It is frequently said that the ability to write is not given to every man; but it may be asked, is it ever given to any man? Is not literary ability an acquirement and a result of study and training as much, for example, as is the ability to perform certain operations in dentistry?

There are, no doubt, so-called geniuses, and there have been men who seemed to have a special genius for writing, but the real geniuses whose works have done the most to uplift and better humanity are those who according to Carlyle had a genius for hard work. Geniuses of this character can therefore be made, and, so far as literary ability is concerned, a fair degree of success is possible even to the ordinary average man if he is willing to make the effort to attain it. Many of our most careful observers and skilled practitioners are timid about publishing their ideas, largely from lack of familiarity with literary methods. Under the mistaken impression that they lack the gift of literary expression, they not only deprive the profession of much that would benefit it and, indirectly, humanity also, but they fail to receive that general recognition from their colleagues to which their real worth justly entitles them; they achieve but a fraction of the reputation which would otherwise certainly come to them.

The literary tendency in dentistry is, therefore, something which should be cultivated and promoted, not only for the benefit of the profession as a class, but for its value to the individual writer, who is the first to receive its benefits.

An additional reason for the individual cultivation of the literary tendency is its educational value to the writer.

A conscientious writer is in the very nature of the case compelled to be a close observer and student; the conditions of his work train him to habits of accuracy in these particulars. None but the hopelessly ignorant or those without a fair degree of respect for the truth have the temerity to submit to the court of public criticism a literary effort not based on experience correctly reported.

Such a course has uniformly proven suicidal to the reputation of the author when persisted in. There is no means of self-education for the dental practitioner more thorough in its effectiveness than the training which leads to successful literary work within his professional lines. There is good reason to believe that the literary tendency in dentistry is constantly developing; the character and volume of the work being done shows an all-around improvement on that done in previous years.

A noticeable and commendable expression of the growth of this tendency is the appearance of several dental periodicals published under the editorial management of undergraduate students in several dental educational institutions in this and other countries. Some of these possess a degree of excellence equal to some, and superior to many, of the dental periodicals published under the editorship of full-fledged practitioners. In this connection we take pleasure in calling attention to the DENTAL JOURNAL published by the students of Michigan University Dental Department, as a creditable and commendable effort in dental journalism.

The training of the dental student in a literary way cannot fail to be of the utmost value to him in his professional career. It is a feature of such importance that the colleges of dentistry would make no mistake in fostering and promoting enterprises of that character wherever possible. Student dental societies are a generally recognized feature of college life, and for equally good, or even better, reasons the college journal should take its place as one of the important auxiliaries of our dental educational method.

A training in dental literary work which has had its inception along with elementary training in dentistry, and where the two are developed *pari passu*, would, if generally adopted, soon lay the foundation for a thoroughness and accuracy in the future literature of our profession which has been sadly lacking heretofore.—*February Dental Cosmos.*

## ESTABLISHING A DENTAL PRACTICE.

The following extracts from a lecture delivered by Dr. Hoff before the Dental Society, February 3, seem to us to be of so much value to the students of our department that we take the liberty of publishing them:

"It is different and more difficult to establish a professional than a mercantile business, for the latter is conducted on set rules, though there are well defined lines necessary to follow in order to build up a professional business, and some of the most elementary rules are the most necessary. The requisite essentials can be classified under the following three heads:

1. Personality.
2. Location or place.
3. Business methods.

"PERSONALITY. The first thing to consider under the head of personality is whether a man is adapted to the work or whether he is a misfit. He must have the right qualities for a professional success, that is, he must be physically a well man, and have average mental attainments. Too many people think anyone can be a success in dentistry. If he has not good physical health he will be unable to exert a magnetic influence over his patients, and it is almost impossible to do good work if the operator is nervous and easily irritated. This is not the only necessity for good health, for energy will develop business. Your resources are yourself and should be husbanded as carefully as the banker does his capital.

"Man is so versatile that he can adapt himself to any condition, and if he has the determination to become a dentist this determination to be thorough will generally make him a good dentist.

"A man should be thoroughly prepared before commencing the study of dentistry, as after-success will depend upon the care taken to qualify, not that we must qualify to gain admission to the college, but because we desire to be in the front ranks of the profession.

"We are too apt to think high position is due to chance, but not once in a thousand cases is eminence in the profession due to any element of chance, but is rather due to hard work, and the man who first qualifies and then works is bound to succeed. Preparation is, therefore, of paramount importance.

"A person should be in hearty sympathy with his work, for he who is not in love with his profession will find it impossible to make a genuine success. Even the distasteful work will be done thoroughly by the dentist thoroughly imbued with love for his chosen calling because of that love. With this and the other two essentials a man cannot help but be a success.

"LOCATION. Hard to give advice as to location, as each one must settle that question for himself. The beginner is apt to be timid, and think he should go to some very small place for a year or two in order to gain experience. The chief objection to this is that he will not be compelled to do anything requiring special skill, and for the real ambitious person this is not the thing. Go in the poorer section of some large city for experience rather than in some country village. A dentist could do a great deal of good among people who are unable to pay much for dental services, and at the same time the operator would gain confidence in himself.

"It is sometimes a good thing for a young man to associate with some older practitioner. Though he will not gain much self-reliance by this he will be kept from many mistakes.

"There are only two other ways—open an office and conquer a business, or purchase a practice, and my preference is for the latter. Any dental office, however poorly it has been conducted, has some clientele, and is better than opening an office, for it will give the beginner an opening, which is all he needs. Around one family an entire practice can be developed. A young man can go to any city in which he wishes to reside and work up a practice, but a practice established in a city where the dentist does not care to live will never give satisfaction.

"Business methods. A dental practice must be conducted on business principles, for the better business man a dentist is the better will be his practice. He must be in his office during business hours, even if there are no patients in sight. Do not be visible in your office after business hours, for it gets your patients into bad business methods. When you make appointments do so with the view of filling up the day and not to rush out a lot of work, or else you do yourself an injustice, tiring yourself out and robbing those patients with whom you have engagements. Keep your appointments, and when it is necessary to keep a patient waiting make explicit explanations.

"Keep your books posted up to date, never trusting your memory for even the slightest operation. Have a system and an order in your business methods.

"The many little technical details should be carefully attended to, and always remember that your patient's time is worth as much to him as yours is to you.

"In conclusion let me say that success is only a relative term and he who is the most in love with his profession, who finds his work most congenial and whose greatest pleasure is performing necessary operations is meeting with far greater success than the dentist who imagines success is to be computed only by the number of dollars received for his services."

## AMALGAM.*

BY STANFORD JAMES FARNUM '96.

Probably no filling material is attracting more attention to-day in the dental profession than amalgam, and from its misuse and abuse at the hands of those who attempt to use it, it has become an object of contempt to many of those who are recognized as representatives and leaders of the profession. Nevertheless, it has proven itself to possess qualities that compel its recognition as a most valuable filling material. It has, like all other filling materials, its good and bad qualities. It is easily handled, is very adaptable to the walls of the cavity, withstands the process of mastication, and preserves the teeth. On the other hand it discolors the teeth. This discoloration, however, does not always occur, and in many cases the fillings keep their original brightness for years, answering in that respect as well as gold. There is no substance in the market to-day that will preserve the teeth for a longer period of time than will amalgam, and it is my purpose in this brief article to call attention to its method of preparation and uses as a filling material.

We will first consider what is amalgam. One or more metals held in combination with mercury, by the mercury, forms an amalgam. Mercury unites readily with most metals, and for this reason is of the utmost importance. There are only a few metals which will not unite with mercury. The only ones that I can recall are iron and platinum, and mercury even adheres slightly to the platinum. Many amalgams have been formed, as for instance, amalgams of lead, silver, iron, zinc, copper and platinum. The amalgam used for the filling of teeth is an alloy containing two or more metals which is cast in the form of an ingot and shavings made. By mixing these with a sufficient quantity of mercury they form a coherent mass. Coarse shavings are better than fine ones as we do not have as large a surface exposed to oxidation. The metals generally used for the formation of the alloy are tin and silver, and to these we may add gold, platinum, zinc, or copper, though rarely using the latter. A great many experiments have been made in the production of amalgams with a view to gaining density and sufficient hardness to resist fracture at the borders, to withstand the process of mastication, to be impervious to the acid secretions of the mouth, and the changes of temperature.

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*Read before the Dental Society, February 24, 1896.

From these numerous experiments the conclusion was reached that silver and tin with the addition of a small amount of some other metal, form the best amalgam, although this is far from being perfect. A small percentage of gold added to the tin and silver alloy forms with mercury an amalgam which hardens rapidly and has sufficient density and strength for filling. It is thought the gold controls the shrinkage to a certain extent. Two per cent. of aluminum added to the alloy makes it brighter, but when the mercury is added heat is produced, and the mercury is thought to burn up or consume the aluminum. It seems to have the same effect on the shrinkage as the gold, but more marked.

Nearly every manufacturer of dental supplies has, through a long series of experiments, placed on sale "alloys" which they call "amalgams" and claimed to possess points superior to all others, and each have their admirers and users, while practically they are the same. The best amalgams set the quickest. We also have on the market gold and platinum alloys which are advertised to be superior alloys as they will not shrink or discolor the teeth. From tables and experiments we find nearly every gold and platinum alloy to be composed of more than fifty per cent tin, and more than forty per cent silver, while the remainder, about seven per cent, is composed of gold and platinum. So the alloys advertised as gold and platinum alloys cannot be much superior to those of silver and tin, for the addition of so small a part of gold can be but in a slight degree advantageous, and the addition of platinum, no matter in what proportions, has not as yet proved of any benefit.

The cause for the majority of failures in the use of amalgam lies in the preparation of the cavity, the rules which govern the preparation of cavities for gold being ignored in the preparation for amalgam. The operator does not prepare the cavity with the same care. In the preparation for gold his first thought is to remove all the decay which is possible with safety to the pulp. This is done to procure a firm foundation and to prevent leakage. The cavity should be easy of access, have strong walls, and beveled borders. While preparing a cavity for amalgam, the dentist usually places little or no importance on the matter of the removal of the decay, especially if the tooth is a little sensitive, and rests easy on the thought that the amalgam will stay in any event. This fact alone accounts for the number of amalgam fillings which either leak or come out, for so long as a bit of decay remains in a cavity to be filled, the filling cannot answer the purpose for which it is intended.. Even more care should be exercised in the preparation of a cavity for amalgam than for gold. The cavity should be slightly larger inside than at the border, nearly ball shaped, to conform with the spherical tendency of the amalgam, no decay or soft matter should be allowed to remain and the walls should be at right angles with the surface of the filling. These conditions are usually very easily obtained, except in compound cavities, and some of these it seems impossible to shape at all. In such cases one should always use a matrix, just as for gold. The less metal inserted in a tooth the better are the results obtained, so in all cases of deep cavities, whether for gold or amalgam, I would recommend that the cavity be first lined with phosphate.

It has been said that the ideal filling material is a plastic, but all the plastics which have been used so far except amalgam have proved themselves of no value. Amalgam is, therefore, with all defects the most permanent and useful of the plastics for filling. There is no condition or position of the teeth and cavities which preclude its use, as it sets almost unaffected by the presence of moisture; its limitations are, however, ignored. I would not advocate its use for the filling of teeth where it will show in conversation, but as a filling material for the posterior teeth there is none better. It is, therefore, often inserted in the bicuspids, molars, and the posterior cavities of the cuspids, and is especially adapted to molars on account of size of the cavities, and the forces to which they are exposed.

One great fault with the dentist is the lack of proper instruments for the insertion of amalgam. For a gold filling we have a large assortment, while many are the operators who attempt to put in an amalgam filling with nothing except a hand burnisher. The instruments need not be many, but only six or seven round ended instruments of different sizes and shapes. There are several methods of mixing the amalgam. The most common, probably because it is easiest and handiest, is by mixing in the hand with the thumb or finger. The best way, however, is by mixing in a mortar, but even then the operator generally completes it in his hand. The method of shaking in a glass tube is very good.

Another important question now confronts us. How much mercury shall we use? This varies with the number and kind of metals in the alloy, more being needed in alloys containing gold and platinum, than in alloys containing silver and tin, and in these cases more mixing is needed to get the proper union. The amalgam should be rolled up in the form of a ball, and, after drying the cavity, it should be placed and then packed either by hand pressure or by malleting. The hand pressure is most convenient and is considered the best method. Another careless habit of the operator is in finishing, for many are the fillings that are sent out without any finish except by the hand burnisher. As a rule the filling cannot be finished at the first sitting, and the best results can be obtained from two to three days after the operation, when it can be finished the same as a gold filling, by using the gold bur and finishing strips.

In conclusion. What is in store for amalgam fillings in the future, by the dental profession, I cannot predict, but if used with care and discretion it will prove itself an excellent material for saving the teeth.

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A UNIQUE specimen of dental art was shown to the JOURNAL early last month by Dr. Darling. It consists of a skull upon the right side of the upper jaw of which is an extensive piece of bridge-work to replace the lost bicuspids and first molar. The anchorages are the second molar, cuspid and right lateral. The two centrals are capped with amalgam upon their lingual aspect and several of the teeth of the lower jaw are crowned with gold. The skull is one obtained from a subject used in the doctor's course in surgery to the medical students.

## EDITORIAL.

At a meeting held in December by the class of '96, the matter of petitioning the Board of Regents, through the Faculty, to change our degree from D. D. S. to D. M. D. and to print our diplomas in Latin, was brought up. A committee was appointed to interview the members of the Junior and Freshmen classes to see if concerted action could be taken in the matter, but as yet the committee has not reported. The arguments of those in favor of a diploma written in Latin and bearing the title of D. M. D., are that, inasmuch as Latin is one of the requirements for admission into the department and that the Medical schools confer their degrees in Latin to students of whom no more Latin is required than of Dental students, we also should receive diplomas written in the universal scientific language. The chief argument in favor of the D. M. D. degree seems to be in the fact that that degree is conferred by but a very few schools and those of the best, while the D. D. S. degree can be obtained by anyone willing to devote eighteen months in three years to this object. While those in favor of a change in the degree have some good arguments, still we think that all should work for unity in the title of the degree conferred upon the practitioner of dentistry, thereby making the degree not only a universal one, but one that will carry with it the conviction that its possessor is entitled to the highest consideration as an alleviator of human ills and pains, and most dentists undoubtedly are in favor of the degree of D. D. S. To the regular medical practitioner but one degree is granted throughout the entire country, and not until the Association of Dental Faculties decides this question of unity in the title of the degree conferred, whether it be that of D. D. S. or D. M. D., can we firmly establish ourselves in the public mind as a liberal and progressive profession.

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In view of the fact that in a few short months the members of the present Senior class will have reached the goal of their ambition and have conferred upon them the degree of D. D. S., the Journal thinks the time propitious for the publication of the Code of Ethics, that each member of the class may have a broader idea of the duty he owes to the profession, his *alma* *mater*, the laity, and to himself. The conception of too many in regard to our professional code is that in restraining from advertising they are living up to the very letter of its articles. This is far from the truth, and though this evil was considered worthy of special mention by the framers of our professional ethics, it is only one of many temptations which urge the recent graduate to depart from his professional morals as he sits in his office waiting for the patients that materialize all too slowly. Success is only a relative term, and while the charlatan may seemingly be prosperous, no one is so well aware as himself that only for a limited period can he hope to retain the confidence and respect of the people unfortunate enough to entrust to him the preservation of their dental organs. The whole substance of our Code of Ethics may be summed up in the Golden Rule, and, this motto ever in mind, together with courage, patience and perseverance, will place our graduates in a position to be an honor to their profession and their *alma mater*, retain the respect of their fellowmen, and, at the same time, cause them to be true to themselves.

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WHY is it that the library of our department is not more generally used by the students? While at any time from one to fifteen can be found there engaged in the perusal of dental literature, this is but a small percentage of the body of students. Is this seeming lack of interest due to indifference to the theories and truths which make the foundation of dental science, or is it due to the fact that the student has so many and varied theories lectured into him that he unconsciously rebells from adding any more at the risk of forgetting some of the facts he has learned earlier in his college course. Should not the fact that the library is ignored by many students point to the necessity of more practical work in prosthetic dentistry? Would not more work *in the mouth* urge the student to greater exertions in studying the principles and theories of every case he might have in hand? While, of course, the clinic in prosthesis is limited, could the college not do the plate, crown and bridge work for dentists too busy too take care of this branch of dentistry for themselves? This would not only be a favor to the practicing dentist, but could be made the source of more or less revenue to the college and of valuable experience to the udents.

AT a meeting of the Dental Society held in December it was voted to make the Society and the JOURNAL joint purchasers of a "Land" furnace, the furnace to be presented to the college for the use of the entire body of students. While some opposition was encountered, it being contended that the college and not the students should make the purchase, still a large majority were in favor of buying this furnace as a step in the direction of more instruction in porcelain work. While our course in crown and bridge-work is all that could be desired, being equalled, probably, by but few colleges in the country, in the matter of porcelain work we are lamentably weak. This, perhaps, is not the fault of our instructors, but due, rather, to the shortness of the course, for the three years spent by the conscientious dental student in the University of Michigan are busy years, and probably not until the course is extended to embrace four sessions of nine months each will it be possible to give adequate instruction in this desirable and fascinating branch of dentistry.

OWING to the frequency of examinations during the past month it has been impossible for the officers of the Dental Society to obtain promises of papers written by students for the meetings of the Society, and Drs. Dorrance and Hoff kindly filled the breach. Dr. Dorrance gave an interesting talk on "Gold and Porcelain Inlays," while Dr. Hoff gave us some valuable hints on the "Essentials in Beginning the Practice of Dentistry."

## REPORT OF THE OPERATIVE CLINIC FOR 1894-5.

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| Crowns, Logan | 57 | Fillings, plastic | 1,335 |
| Crowns, gold | 57 | Treatments | 1,350 |
| Crowns, porcelain | 3 | Extractions | 609 |
| Bridges | 8 | Cleanings | 493 |
| Bands | 2 | Number patients | 7,540 |
| Fillings, gold | 5,305 | Number operations | 9,219 |

In Dr. Dorrance's clinic up to date 439 cases have been presented and operations completed for seventy-nine persons, including three operations upon the superior maxillary and one upon the inferior. Two cleft palate cases have also been cared for.

## ALUMNI NOTES.

Dr. F. C. Clapp, '95, was married January 1, 1896.

Dr. Harry P. Ball, '92, is located at Albion, Michigan.

We learn that Dr. B. T. Ruthruff, '95, is practicing at Lorraine, Ohio.

Dr. A. Barnes, '95, has left Petoskey and is now practicing at Grand Ledge, Michigan.

A recent letter from Dr. George W. Kenson, '94, of Mansfield, Ohio, states that his practice is all that can be desired.

The story comes from Decatur, Illinois, that Dr. T. S. Childs, '92, was lately presented with a two and one-half pound boy.

Dr. F. P. Graves, '95, is located at Lansing, where he has began practice for himself, having left his father's office at Battle Creek.

Dr. J. H. Neeley, '95, was married to Miss Lula A. Sites, of Lancaster, Ohio, on January 1, 1896, at the home of the bride. Congratulations of the JOURNAL.

Married.—On January 1, at Oshkosh, Wisconsin, Dr. Harry B. Hinman, '95, of Bucyrus, Ohio, to Miss Katherine A. Ihrig. Congratulations of the JOURNAL.

Dr. O. M. Barton, '95, a member of the JOURNAL staff of last year. is now located at Boise City, Idaho. The best wishes of the members of the present staff are yours, Barton.

Dr. G. A. Rawlings, '93, of Bismarck, North Dakota, visited the college and numerous old friends on February 26 and 27. "Vet" reports his practice as being in a very flourishing condition.

We learn that Dr. F. W. Boyer, '93, who gave up the practice of dentistry to enter the salt manufacturing industry, is possessed of a four months old boy, and that he himself has grown to the enormous weight of 215 pounds.

Dr. Jas. K. Douglas, '94, of Sandusky, was married to Miss Maora Belle Hill, of Berlin Heights, Ohio, on December 31, 1895. A wedding trip to Detroit and a visit with Dr. and Mrs. J. Lathrop, Jr., followed. The JOURNAL wishes the happy pair all there is of good in life.

C. A. Hawley, D. D. S., '93, editor-in-chief of the JOURNAL for that year, has been made professor of Orthodontia, Dental Anatomy and Crown and Bridge-work of the Dental Department of the Ohio Medical University of Columbus, Ohio. Dr. Hawley is one of the most progressive of our graduates and the Ohio Medical University is to be congratulated. The JOURNAL'S good will is extended.

Misfortune seems to follow Dr. B. S. Palmer, '83, of Chicago. On July 4th last, while attending a game of base ball, a giant cracker exploded near him and the loss of an eye resulted. On January 1st, the doctor was operated on for appendicitis and a recent letter to Dr. Watling says that he is becoming afflicted with a cataract on his remaining eye. Troubles never come singly and the JOURNAL extends kindest sympathy.

## DEPARTMENT NOTES.

The Dental department reached its majority with the close of 1895.

F. J. Hale, '96, improves his Saturdays in the office of Dr. Watling, at Ypsilanti.

The dental library was open to the public from 9 to 12, during the Christmas vacation with the exception of Christmas, New Years and Saturdays.

The first sections in histology, qualitative chemistry and practical anatomy finished these courses at the time of the Christmas vacation. The second sections in the latter two studies now occupy the laboratories.

C. E. Pease, '98, C. F. Fitch, '96, and C. F. Steinbaur, '98, were at Lansing and Grand Rapids with the Glee and Mandolin clubs the first of the holiday vacation. Later in the intermission they were at Toledo and other points.

The committee on commencement invitations, consisting of H. J. Livingston, J. N. Clark, C. L. Sherwood, I. W. Copeland and B. T. Hunt, have placed their order with the engraving firm of E. N. Wright, of Philadelphia. The chairman of the committee, H. J. Livingston, has a sample of the invitation which can be seen by anyone interested.

G. F. Conley, '98, has recovered from a recent attack of the grip.

Miss Jessie Castle, '96, has recently been confined to the house for a few days with the grip.

An inspection of the mechanical work executed by the members of the Freshman class convinces one that there is a great deal of artistic ability in the class of '98.

The students who remained in Ann Arbor during the holidays were allowed the use of the laboratories from 9 to 12 o'clock on all days except Christmas, New Years and Saturdays.

The alumni of the department will be sorry to learn that the dome of the main building has been removed. Its removal was necessary for the safety of University Hall and makes a decided change for the worse in the appearance of the building.

Considerable interest is being manifested over the '96 class picture to be placed in the operating room, it being undecided as yet whether it be cabinets of the individual members set in matting or a group picture of the class and faculty, both having their advocates.

The following officers were elected for the second semester for the Dental Society: President, A. P. Dutch; Vice-president, S. A. Scharlotte; Secretary, Miss Bessie Hutchinson; Treasurer, Carl Putt. Papers were read by S. J. Farnum, '96, and C. A. Quackenbush, '96.

The prospects are favorable for having a department base ball team. A meeting was held by the Freshman class with that object in view, at which a Manager and Captain were elected. Nearly twenty applications have since been received for positions, and as there are quite a number of good players among the classes a creditable team can be expected.

Some ill-advised person or persons on the evening of February 13 took the liberty of using the door of the front entrance of the Dental building as a bulletin board to notify the public of an X. Y. Z. ball. While the erratic and irregular form of our old building is hardly appealing to an artistic eye, nor its color such as would cause a stranger to be struck with admiration, still the students of the department have strong objections to its use as a bill board.

Dr. Neeley will quiz the Seniors in Dental Surgery and the Freshmen in Histology this semester.

C. L. Kemery, '96, was confined to his room for a couple of weeks during February with an attack of parotitis.

The question, "Where are you going to locate after graduation" is frequently asked in the corridors of our building among the Seniors.

Would it not be a good idea to have more chairs in the library? As it is at present, only about a dozen students can find seats at one time.

Germany has another representative in the Freshman class in the person of Charles Lebert, who entered at the beginning of the second semester.

During the recent absence of Dr. Haidle, Dr. Hoff lectured to the Freshmen on the subject of mechanical technic. This was the first lecture delivered to the '98 class by Dr. Hoff.

The Freshmen have selected a class pin, which is of a very neat design. It is diamond shaped, contains the college colors, a small forcep to represent the department, and the figures '98.

The appeal for more light in the operating room, which has been made by the Seniors year after year has been heard, and now the room is illuminated by means of the improved Welsbach gas burners.

An instructive lecture was given the Freshman class last month by Dr. Dorrance on the subject of cleft palate. The lecture was made especially interesting by the presence of a cleft palate patient.

Some excitement was caused a short time ago among the Seniors by the rumor that the diplomas to be received were to be changed to a much smaller size, of poorer material and worse type. Only an idle rumor, however.

The following students represented the Dental fraternities on the various Annual Promenade committees. Delta Sigma Delta—W. H. Johnson, '97, chairman of committee on arrangement; H. D. Watson, '97, committee of invitation; C. A. Devlin, '96, committee of decorations. Xi Psi Phi—S. W. Hussy, '97, general secretary; S. K. Scharlotte, '97 committee of arrangements, and C. F. Fitch, '96, reception committee.

There have been several interesting cleft palate cases in Dr. Dorrance's clinic during the present school year, and several more are expected before the spring vacation. Dr. Dorrance has given some very instructive lectures on these cases and how to handle similar ones in practice.

We now have two modern chairs in the operating room, which are, however, private property. W. J. Stapish is the owner of one, a Wilkerson, and the other, a Columbia, is the property of F. G. Powers. Other chair manufacturers would find it to their advantge to have one or more of their chairs where they could be inspected by the students.

The following ladies were entertained by the Dental fraternities at the First Annual Promenade: Xi Psi Phi—Mrs. Lowrie, Ann Arbor, and Mrs. Charles Babbitt, Jackson, Chaperones; Misses Potts, Babbit, and Hunt, of Jackson; Miss Powell, of Marquette; Misses Smith, Kearns, Burke, Seery, Durham, Kemper, Dilworth, of Ann Arbor; Miss Loder, of Lapeer. Delta Sigma Delta—Mrs. N. S. Hoff, Mrs. Stoup and Mrs. Deuble, Chaperones; Misses Remington, Deuble, Ellis, Ypsilanti; Miss Town, Cadillac; Miss Staebler, Ann Arbor; Miss Hill, Detroit; Miss Saxton, Jackson; Miss Johnson, Alliance.

At a meeting of the Dental Society, Monday, February 19, Dr. Dorrance gave a very interesting and instructive talk on "Gold and Porcelain Inlays." He said he was aware that many members of the profession were opposed to their use, but it was his opinion, after an experience of many years, that if used in their proper place and properly inserted porcelain and gold inlays possessed many commendable features. On the labial surfaces of incisors porcelain finds its best field, while on large, though not deep cavities of molars and bicuspids gold or porcelain could be used. The formation of cavity and the thorough burnishing of the shell of platinum or gold to it were of primary importance to a successful filling. He had several models with him, showing the work in its different stages. The talk was listened to with great interest by those present and Dr. Dorrance was given a vote of thanks by the Society for his efforts in their behalf.

I. W. Copeland was out of town a few days between semesters.

F. G. Powers spent a few days in Battle Creek at the close of the first semester's work.

The Dental Department was well represented at the Leap Year party given by the ladies on the afternoon of February 29. Over $500 was realized by the ladies towards their gymnasium fund.

A chapter of the Delta Sigma Delta fraternity was established at the Detroit Dental College Saturday, January 22. Alpha chapter of Ann Arbor was represented by B. T. Hunt, '96; C. A. Devlin, '96; S. J. Farnum, '96; C. H. Bailey, '96; F. R. Fletcher, '97; and E. J. Anderson, '98.

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Victor C. Bell, D. D. S., Special Lecturer upon Crown and Bridge Work, New York Dental School writes: "I consider Borine an excellent general antiseptic mouth wash and cordially recommend it to my patients, especially to those wearing artificial dentures."

Dentists will find in Borine prophylactic and hygienic properties that make it invaluable as a mouth and tooth wash, in fact Borine might be termed "The Ideal Dental Antiseptic."

Borine in its natural state will devitalize the mouth in a quarter of a minute, while it does not harm the delicate epithelium or injure the dentine, a fact which cannot be claimed for any other antiseptic.

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# HÆMOPHILIA.*

BY J. H. NEELEY, D. D. S., '95.

BEING very recently called to treat a severe case of bleeding, and being also requested to mention to the profession a very peculiar case that came under my observation during the month of August last I have chosen the subject of Hæmophilia for a short talk this evening, hoping to present to you a few thoughts that at some (usually unexpected) period may prove of value.

In August last, a boy twelve years of age and a supposed hæmophilia was brought to me by his father and his attending physician to have several temporary teeth extracted, experimentally to determine the advisability of a more serious operation they were then hoping to make. Upon examining the mouth I noticed a very peculiar arrangement of the teeth, the permanent ones standing very irregular, but the temporary ones all present, being carefully retained for fear of lacerating the gums sufficient to cause bleeding, a brother having died from a similar cause.

Not desiring to risk too much, an upper and lower temporary incisor were removed, with no apparent sign of dangerous bleeding. The parent was encouraged and was planning for the more severe operation, when matters took a sudden turn. Some twelve hours after the extraction and upon the patient lying down extensive capillary bleeding began, and, for a time, refused to be checked. The striking feature of the case was the fact that bleeding never occurred in both jaws at the same time, always ceasing in one before appearing in the other.

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* Read before the Dental Society, March 30, 1896.

Careful inquiry revealed the fact that the male children were all affected with the bleeding tendency, while the females were entirely free. The parents also were healthy and could in no way account for the marked appearance of it among the boys. The disease is perhaps best defined as a congenital and habitual disposition to the occurrence of hemorrhage.

It usually begins in the very earliest years of life, rarely, if ever, originating in middle life, and very rare is it that a marked bleeder in infancy loses entirely the idiosyncrasy in youth and remains thereafter free from attacks.

Reports show it to be almost entirely a modern acquisition and the most hereditary of all diseases. It does not seem in any sense a true pathological process, but rather an abnormal condition depending on some original vice of structure. The only mark is a certain delicacy and transparency of the skin, with a superficial position and a marked fullness of the subcutaneous vessels. The vascular system alone seems out of order. The intima appears thin and in many cases apparently undergoing a sort of fatty degeneration, rendering it unable to withstand the high blood pressure to which it is subjected.

Family transmission direct and indirect is the most important cause of the disease, the indirect transmission being the most marked; that is, after one or more cases have appeared among the children of healthy parents. The disorder is handed down, not by the bleeders themselves, but by the non-bleeding brothers and sisters. A large number of bleeders die so early in life as to be unable to take any part in the propagation of the disease, but bleeder families present another remarkable peculiarity, viz.: Extraordinary fruitfulness of the non-bleeder brothers and sisters, direct investigation showing that the average number of legitimate births in bleeding circles is nearly twice that of the general average.

The anomaly occurs most frequently in the males and generally only the males or the females of the same family are affected, rarely both; but if both are affected the males are in excess. While the males are affected most frequently the females possess in a far greater degree the capacity for transmitting the disease by inheritance to the offspring. Male bleeders rarely beget bleeder children by women of non-bleeder families, but children of women who themselves are bleeders are uniformly affected with hæmophilia.

Again, the males in bleeder families who themselves are not bleeders seldom beget bleeder children from healthy wives, but among the children of women who belong to bleeder families, but who are not bleeders themselves, some are generally found who are marked bleeders. Hence it must be admitted that to the non-bleeder women in bleeder families is due the constant and increasing spread of the disease. Bleeding usually appears in early childhood, especially at the time of first dentition, and gradually declines in intensity with advance of life, but in some cases the symptoms recur again and again up to old age. While the exciting causes are usually wounds, contusions or wrenches, the little scratches, harmless to ordinary persons, are seemingly the dangerous ones, death resulting more often from slight than from extensive wounds. Death usually results from the first attack, a very few reaching maturity. Out of two hundred and twelve cases reported by Grandidier one hundred and twenty-one died under eight and only twenty-four reached the twenty-second year. In treatment the cautery should never be used. Compression for hours and often for days is good, where it may be obtained. If bleeding is from sockets of extracted teeth a tampon of cotton saturated with per-sulphate of iron may be put tightly in the socket and retained by closure of the jaws. For internal treatment acetate of lead, two grains every two hours, is perhaps the most trustworthy. Ergot, thirty minims every two hours, is also good. In extreme cases both drugs may be used with excellent results. Alum and tannin are less reliable. If the patient is an infant the mother or nurse may compress the part with the fingers for hours, if necessary, until the bleeding ceases. If the sockets are shallow an impression may be taken in compound, the cavity packed with styptic cotton and the impression again slipped to place and retained as long as necessary.

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Base ball and rugby men would confer a favor upon the members of the Senior class by refraining from breaking the windows in the operating room, especially when clinics are being conducted.

# DENTISTRY IN THE UNITED STATES.*

BY C. A. QUACKENBUSH, '96.

DENTISTRY was introduced into this country nine years before the Revolutionary War, John Woofendale, an Englishman, in the year 1766, being the first to practice dentistry on this side of the Atlantic. Later a Frenchman, named Lemaire, came over with the French fleet and served as dental surgeon among the soldiers in winter quarters near Providence, Rhode Island. Here, in a military camp, enlisted as soldiers for the cause of independence, as pupils of Dr. Lemaire, Jarial Flagg and John Garette became the first students of dentistry on American soil. Both became proficient in their profession, and also served as gallant soldiers. Flagg afterward received the commission of a major in the war of 1812.

In 1770 Dr. Isaac Greenwood came from England to Boston and practiced dentistry until his death. His two sons, Clarke and John, chose the profession of their father. John, too, was a soldier. He fought at Bunker Hill and at Trenton and went with Arnold on his expedition into Canada. His reputation as a pioneer dentist rests on the fact that he served in that capacity the first President of the United States. Out of the tusk of the hippopotamus, he carved a full set of ivory teeth for the "Father of his Country." He is also credited with having swedged up the first gold plate in America.

Some of the other forefathers of American dentistry were Hudson, Randall, Hayden, Kœcker and Parkhurst. Most of these men had studied at medical schools and were well fitted for the crude operations that then constituted the practice of dentistry. So even from the earliest days of the history of the professsion we have had men whose presence has been most beneficial, and whose examples are well worthy of imitation. Such men have laid the foundation stones on which is built the present system of dentistry.

The number of dentists in the country in 1800 was one hundred. Ten years later this number had grown to only three hundred. But at the present time we have more than twenty-five thousand. Estimating the population at sixty-five millions, we have one dentist for every twenty-six hundred people. Of course the number is increasing rapidly, but so is the population. Many of the old practitioners are retiring; there is a constantly increasing demand for dental work, and it has been stated that a large proportion of the dental graduates, for various reasons, do not practice long after graduation. So we believe that for the well equipped and enthusiastic dentist there is still room at the top.

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*Read before the Dental Society, March 16, 1896.

A few figures given by Arthur may give us some idea of the magnitude of the work that is annually accomplished by the dental profession in this country. In 1880 there were three millions of porcelain teeth manufactured and used to replace lost dental organs. In the same year the number of teeth extracted was estimated to have been twenty millions. Undoubtedly many of them were sacrificed to the unwise use of the forceps, and could have been saved. The amount of pure gold manufactured into foil and used to prevent the ravages of caries was three tons. Think of it! Three tons of pure gold used every year to fill cavities of decay, to say nothing of other filling materials!

Arthur goes on to say that the American dentists take the firse rank in the world as operators, and, as we know, Dr. Weeks says that the graduates of the U. of M. are the best gold workers in America. The logical conclusion is evident. Even in Paris, the French dentist who has never seen America puts on his sign "Dentiste Americain."

The upbuilding of the profession of dentistry from a small beginning in 1800 to its present magnificence we attribute to three causes:

1. Dental societies.
2. Dental literature.
3. Scientific discoveries.

These three, by stimulating thought, encouraging investigation and research, and producing a demand for higher qualification of the dental practitioner have been influential in bringing about the establishment of the dental colleges and the dental laws.

Dental societies have been one of the most potent factors operating for the enlargement and general welfare of the profession. They have largely wrought in a mass the individual dentists of the country. They have opened up a valuable channel for the exchange of ideas and for the gaining of knowledge. By this means the dentist is enabled to come into touch with his professional brethren—to compare himself with others and to catch many valuable hints that would otherwise escape him.

But of all the forces that have been at work in the uplifting of the dental profession there is none more powerful than our dental literature. This has grown to such proficiency that it embraces every phase of dental art, which is thus brought easily within the reach of every dentist who is at all progressive. He is enabled to keep up with the times and to ever have at hand a valuable source of knowledge. If he cannot attend the county or state dental society, he can read the dental journals.

We have in mind a dentist who had practiced twenty-eight years, and who did not know that the inferior dental artery existed. He was not a reader of dental literature.

The value of this department of dentistry cannot be overestimated. It is voluminous with the valuable works of its many authors, many of whom are noted for their scholarly attainments and abilities.

Dental literature may be divided into two classes. The first class we would denominate as standard works, and mention as some of its most eminent authors, Abbott, Arthur, Black, Bödecker, Colyer, Garretson, Farrar, Harris, Evans, Gorgas, Taft, Talbot, Tomes, and many others with whom we are all acquainted.

The second class is current literature, as the periodicals, which always print so many new and interesting ideas, methods and suggestions.

The first dental journal was the American Journal of Dental Science. It was first published at Baltimore, 1839, the same year in which the first dental college was founded.

We have at present no less than ninety dental periodicals. Some of the most popular are the *American Journal of Dental Science*, *American Dental Review*, *Dental Cosmos*, *Items of Interest*, *Ohio State Dental Journal*, *Dental Review*, *Archives of Dentistry*, and many others could be named.

Scientific discoveries have had much to do with the progress made in dentistry of late years. The discoveries made in bacteriology, histology and pathology make it possible for the educated dentist to perform his operations in a scientific manner.

The increase of new remedies enables the various diseases to be treated each in its peculiar and proper way. The discovery and use of chloroform, ether, nitrous oxide and cocaine, have done much to make dentistry what it is.

The use of India rubber and the perfection of crown and bridge work have greatly increased the demand for artificial dentures. The wearer of artificial teeth is no longer obliged to pay for the expensive gold or silver plate of early days, for the rubber plate can now be made by some so-called dentists for the price of three dollars; while a substantial piece of work is obtainable by all who care to have it.

To Dr. C. A. Harris is due the credit of making the first attempt to establish a dental college in the United States. In 1839 he attempted to found a dental school in connection with the University of Maryland, but was unsuccessful. Later he became instrumental in establishing the Baltimore College of Dental Surgery, the first dental college in this country. He has been justly called the founder of the dental educational system in the United States.

We now have forty-six dental colleges. Illinois claims the largest number, having eight. The dental department at Harvard was founded in 1868; of the University of Minnesota, 1888; and that of the University of Michigan, 1875, so we are now twenty-one years old.

In making the advances that we have in the past ninety-six years, we have simply kept apace with the same American "go-aheadism," as the Frenchman calls it, that has characterized all other phases of American progress. We are no longer regarded as mere mechanics and tradesmen, but stand before the world, members of a respected, useful and dignified profession.

## FRACTURE AND TREATMENT OF INFERIOR MAXILLARY.

BY F. E. LOGAN, '96.

In early times if the surgeon who was called upon to treat fracture of the inferior maxillary succeeded by some means to cause the fragments to unite he congratulated himself on having treated the case so successfully. It was of little consequence to him whether the contour of the face was marred or if the teeth were not perfectly articulated.

At present, however, it is very different. When the bone is firmly united the face must have its original contour and the teeth articulate, as before the accident was sustained, or our patient is dissatisfied and we are no better pleased than he. Therefore it is quite essential that every dentist should be well informed in this particular branch of surgery, for he is liable to be called upon at any time to treat a fracture of this kind either in co-operation with a surgeon or alone.

In fracture of one of the limbs the general surgeon has only to contend with the contractility of the muscle upon which the limb depends for action, but this is not the case in the lower jaw, for besides the muscles which govern the movement of this particular member, he has also to contend with the muscles of the tongue, larynx, pharynx and neck, all of which tend to displace the fragments and without the aid of a skilled dentist the result accomplished is rarely, if ever, what it should be.

Fractures of this bone are difficult of treatment; first, because of the inability to splint them in the same manner as other bones; second, on account of the numerous muscular attachments, most of which, besides giving mobility to the jaw, perform various other offices.

There are two classes of fractures, simple and compound. In the former there is a single break in the continuity of the bone without any external or associate injury. In the latter, however, we may have two or more fractures accompanied with laceration of the soft tissues, injuries of the nerves, vessels, teeth, etc.

Blows from the fist, kicks from animals, falls and gun-shots are the most common causes of fractures, or any similar concentrated forces may cause simple or several breaks to occur simultaneously.

The seat of the fracture depends much on the condition of the arch, the direction and character of the force brought to bear upon the bone, but usually the lesion occurs at the point where the force has been applied.

Symptoms denoting fracture of this bone are very seldom, if ever, of an obscure nature, so that you can usually make a definite diagnosis. You will observe that the bone can be moved at the break, causing a grating sound or crepitation, the line of the teeth generally being irregular.

When fracture has taken place under the attachment of the masseter muscle the jaw is not displaced, but crepitation is always present, and when the neck of the bone at the condyle is broken the jaw is drawn forward and to the opposite side by the action of the internal pterygoid muscles.

Pain, swelling, inability to masticate, crepitation and irregularity in the dental arch, these symptoms when taken collectively, afford us abundant proof that fracture of the bone has occurred.

When inflammation and swelling are present they may be controlled by the application of cold water, or better to apply cloths which have been saturated in a pint of water to which has been added lead acetate, ʒii; laudanum, ℥ii.

The manner of treatment of these fractures depends much upon each individual case. As far back as five centuries, B. C. Hippocrates used ligatures of silk, gold and platinum wire to hold the fragments in place, but in the present age we prefer to resort to more substantial means.

Bandages have been used alone to hold fractured parts in their proper position, but in oblique fractures the bandages are rather unmanageable, and it is almost impossible to counteract the tendency of the internal pterygoid muscles from drawing the rami forward.

Many surgeons use the gutta percha splint, which is readily formed. The fracture is first set, the jaws approximated, and the gutta percha is moulded to the parts. Then this mould is held firmly in place by bandaging.

When the fracture has occurred near the anterior part of the mouth, an anesthetic has been given, and good results have been obtained by drilling holes near the end of each fragment from the outer surface; a silver wire is passed through the holes from the lingual side and the free ends are twisted tightly on the labial surface, this causing the ends of the bone to be drawn into close apposition and preventing its movement. This wire does not favor the accumulation of foreign substances, is easily kept cleansed, and does not cause any unnecessary annoyance to the patient.

In compound fractures the interdental splints are invaluable and reliable, and the one which is easiest in construction, taking up the least amount of room in the mouth, and having the requisite strength and other qualities which go toward making a splint serviceable is the one we desire to have. We must first take an accurate impression of the superior maxillary and pour up a model. Now take an impression of the lower maxillary, which may be taken in section or entire. After procuring models from these impressions, saw them into sections and articulate them to your model of the superior teeth. This being done unite the blocks in one piece by a little soft plaster. If you have been careful in your work the reconstructed model represents the jaw as it was previous to the accident. Now make a plate of vulcanite to cover the crowns of all the lower teeth and of the upper teeth also, as far as the cuspids, leaving the remaining space to feed the patient through. Then fit the plate to the upper teeth first, the lowers may then be fitted into the lower surface of the plate and when this is accomplished you have all the teeth in their normal position. Take a bandage 1½ yards long and 2½ inches in width, stand behind the patient, rest the chin on the centre of this strip, and carry the ends up, cross on the forehead, carry around the sides of the cranium, cross again at the occiput, carry forward and tie or otherwise fix in front of the chin. The patient should then be given an antiseptic mouth wash and a syringe with instructions to thoroughly cleanse the mouth once a day at least. Leave the splint on for about twenty-eight days.

Fractures may sometimes fail to unite. This may be caused from comminution, want of rest, or faulty apposition of the parts. Should necrosis exist, await the exfoliation of the sequestrum and treat for necrosis. If the ends of the fragments become rounded and tipped with cartilage an operation is necessary. This may be accomplished by boring holes in the end of each fragment and wiring them together. Irritating the ends by rubbing the fragments together, thus causing the desired inflammatory action, is still another means sometimes employed.

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This has been a banner year for athletics, that is as far as the Dental Department is concerned. Never before has there been so much interest, or has it contained so many candidates for athletic honors.

# CHLORATE OF POTASH AS AN ANTISEPTIC.*

BY P. G. UNNA, M. D.

IN 1884 Prof. Miller first published in the "*Deutsche Medicinische Wochenschrift*" the results of his experiments as to the action of various antiseptic agents on bacteria cultures taken from the cavities of the mouth.

These tests interested me very much, mainly because my attention had previously been called to the constant activity of the schizomycetes in the formation of mercurial stomatitis. Having noticed that Miller's tables, which had formerly been generally referred to, made no mention of either chlorate or permanganate of potash, I suggested to the author the advisability of subjecting to an examination this class of oxidizing substances, particularly chlorate of potash, permanganate of potash and peroxide of hydrogen in his future experiments. The idea that the bacteria of the mouth, accustomed to the continuous deoxidation taking place might possibly be rendered less harmful by the employment of oxidizing agents, guided me.

Prof. Miller was kind enough to entertain my proposition, and in the following year published a number of new tables, all of which contained the three ingredients spoken of. It was noticed, however, that peroxide of hydrogen alone directly interfered with the growth of the fungi of the mouth; its destroying properties being second to that of corrosive sublimate and nitrate of silver. Permanganate of potash acted much weaker and surprisingly weak was the action of chlorate of potash, mentioned at the end of the list of antiseptics. The latter is detrimental to the growth of schizomycetes only when used in a solution exceeding the proportion of one to eight.

The apparently unfavorable showing of Professor Miller's experiments is evidently responsible for the little importance at present attached to chlorate of potash in the manufacture of preparations for the preservation of the gums and teeth, and I am confident that modern antisepsis in treatment of the mouth is fully in accordance with the principles set forth in the valuable and well-known hand-book of Miller.

On page 226 Miller says:

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*Translated from *Monatshefte für Praktische Dermatologie.*

"It is noteworthy that such useful agents as chlorate of potash and permanganate of potash possess such subordinate antiseptic properties; like iodoform the favorable action of these remedies does not particularly depend upon their antiseptic value."

Nothwithstanding the conclusion drawn from Miller's tables, I was still so fully convinced of the specific value of chlorate of potash in diseases of the mouth, that I was reluctant to discard my favorite remedy. My own conclusion was that, if the efficiency of chlorate of potash as an antiseptic was to be enhanced, a much higher concentration would have to be used.

From that time on I discarded all solutions and employed pure chlorate of potash in the form of a tooth-paste containing fifty per cent. of the salt.

In this manner I achieved much better results than before, not only in mercurial stomatitis, but also in all diseases of the mouth, occasioned by the formation of schizomycetes.

During the past eight years in which I have employed chlorate of potash in this modified form I never had occasion to look for a better cleansing agent for the mouth, tonsils, and teeth. Naturally I fully agree with Miller that the efficacy of this remedy does not solely depend upon its antiseptic value.

It is my opinion, that it possesses marked tonic properties acting favorably on mecurialized gums and imparting increased circulation. In many other affections of the mouth and tonsils the property of chlorate of potash of furthering secretions is particularly commendable.

To obtain this result the pure chlorate of potash must be used; a small quantity is spread on the tooth-brush, applied to the teeth and gums and rubbed to a paste. After rinsing the mouth with clear water, a somewhat salty, but refreshing taste remains.

I know of no other preparation that will remove so quickly and effectually the fœtor oris, which is most apparent after meals and upon awakening in the morning. A number of cases in which this fœtor proved sufficiently objectionable to enlist medical aid were promptly cured by the application of chlorate of potash, after the patients had been treated for internal ailments.

Chlorate of potash, being a neutral salt, has absolutely no detrimental effect on the teeth; if used in the concentrated fifty per cent. form, it will promptly check the growth of the fungi for a long time, and in many instances destroy them entirely.

Chlorate of potash having been declared a poisonous chemical, it is safer to employ in the form of a tooth-paste; thus the possibility of an accident is excluded.

It has been demonstrated that the daily use of chlorate of potash tooth-paste is the very best prophylactic against caries of the teeth and affections of the tonsils, including diphtheria.

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## GUAIACOCAINE CATAPHORESIS: OUTFIT AND TECHNIQUE.

BY WILLIAM JAMES MORTON, M. D., NEW YORK, N. Y.

So many inquiries have been addressed to me asking for information as to methods of procedure, that I gladly take the opportunity to answer them collectively through these columns.

*Source of Current.*—The "*continuous*" or "*constant*" electric current, whether obtained from the street mains or from any reliable battery, is the current required in cataphoric procedures. Alternating and pulsating currents are not practically available.

The "Edison Current," 110 volts, as in common use, requires a controlling device. The best is the "Wheeler Fractional Volt Selector." For controlling street main currents of a higher voltage than 110, special devices must be obtained.

As to a battery, a portable "red acid cell" of twenty cells, or any form of Leclanché cell, say thirty cells, or any other good battery, will answer every purpose.

*Electrodes.*—These devised and invented by the writer, are an "indifferent" or "dispersing" electrode and "active" electrodes. The small dispersing electrode is a circular disk of carbon, three inches in diameter, covered with two layers of sheet punk or amadou, bound at the edges by an insulated wire pressing into a groove.

This is large enough for use in cases of anesthetization of the gums or of sensitive dentine. For large areas of skin a larger dispersing pad electrode, say 6x6 inches, should be procured.

The active electrodes vary in shape according to the purpose to which they are put, but retain the special device of perforations to hold solution, etc. For the skin flat single plates of carbon or block tin of circular shape suffice. For the mouth in general a flat electrode resembling a mouth mirror is convenient.

For the gums, for use in extraction, implantation, etc., the electrode is made tong shaped and unlike any electrode of this shape formerly constructed; *both* plates are of the *same* polarity.

The carbon, or block tin, in the active electrodes is one-fourth of an inch thick, is perforated freely to about two-thirds of its depth by drill holes one millimeter in diameter, or is perforated completely and a shallow reservoir provided behind it to hold an excess of solution. The body of the electrode is of ebonite, raised two to three millimeters at the edges of the plates to form a cup into which is inserted a piece of soft and porous blotting paper cut to fit exactly, or a soft piece of felt or other absorbent material.

For sensitive dentine the active electrode is a small stiff piece of platinum wire tubular at its end, and perforated from the sides into the tube in order that it may hold an excess of the solution. Around the end of this "applicator" is wrapped a pledget of absorbent cotton.

This constitutes in the main all the electrodes necessary; modifications for special cases will suggest themselves.

*Rheostat or Current Controller.*—If the current from the street mains is to be used, preference has already been expressed for the "Wheeler Fractional Volt Selector." This same apparatus is equally available with a battery current. Its chief utility is in relation to sensitive dentine, where it is of highest importance that the initial voltage employed and current strength attained shall not cause pain. But in relation to the skin and mucous membrane any ordinary rheostat will answer the purpose.

Again, it is quite possible to one at all familiar with his "galvanic battery" to use the ordinary cell selector to bring into circuit a limited number of cells (thus working with a low voltage), and to regulate the flow of current from this small number of cells by aid of common water rheostats, provided that ample sponge tips break the strength of the first water contact.

An instrument like the fractional volt selector, however, saves trouble and annoyance.

*Milliamperemeter.*—Not only is it necessary to regulate the voltage employed, but also it is equally essential to have an instrument to record the rate of flow of the current attained. This, of course, varies according to the voltage, or, what is more important, according to the resistance, which in this case is tissue. This rate of flow termed "current strength" is measured in amperes, and in medical and dental work in thousandths of an ampere, namely milliamperes. A very small fraction of a milliampere causes pain in sensitive dentine. No reasonable idea of "dosage," nor means of comparison with other cases can be had without the record of a milliamperemeter. It is a constant guide to the administrator.

Any good milliamperemeter will suffice, but its scale should be large and easily read. An instrument recording from one up to ten milliamperes is preferable.

*Solutions and Fluids.*—Aqueous solutions of from four to thirty per cent. of hydrochlorate of cocaine may be used. The writer, by combining guaiacol and anhydrous hydrochlorate of cocaine, has found what seems to be a new compound rather than a solution. To secure uniformity of action (for some guaiacols are far more irritating than others), the solution or compound is termed *guaiacocaine*. It is a ten per cent. mixture of hydrochlorate of cocaine in pure guaiacol; this per centage may, if desired, be increased to thirty per cent. This solution as above given, answers every purpose perfectly for anesthetization of dentine and of the skin, but for use upon mucous membrane it should be diluted to at least one-half, or otherwise slight and superficial destruction of tissue may ensue. I use for dilution a ten per cent. solution of cocaine in glycerol, mixing it with guaiacocaine in equal parts. Guaiacocaine may be procured of McKesson & Robbins, New York, or at dental depots.

*Technique.—Skin.* Using aqueous solutions of cocaine, the skin must first be thoroughly washed with soap and water. When guaiacol is employed, this is unessential.

*Mucous membranes.*—No preliminary preparation of the mucous membrane is required.

As to the active electrodes, the solution is *first* dropped into the perforations until they are full; the absorbent material is then fitted to the shallow ebonite cup or wrapped about the applicator, and a liberal supply of the solution dropped upon it. It is now ready for use.

The flat electrode is applied directly over the spot to be anesthetized and pressed with some firmness against it, as, for instance, over a cancrum oris of a buccal surface.

In the case of the tongs electrode, some care is requisite to secure a proper adjustment and to secure uniform action. It is well, after the electrode is in place, to pack in absorbant cotton, not too wet with solution, to fill up inequalities of contact, or to bridge over (in certain cases) the gap between the blades.

For dentine, the cavity is first filled (a rubber-dam should be used) with a pledget of absorbent cotton dipped in the guaiacocaine solution (avoiding a surplusage and yet not too dry); the applicator itself should then be dipped in the solution until it holds all it can, and a small layer of cotton be twisted about its end. During treatment, the current may be turned off, possibly twice, and the pledget in the cavity be freshly dipped in the solution, or, as I prefer, by the use of my own applicator, this pledget may remain *in situ* and the fresh supply be furnished by removing and dipping the applicator itself into the solution; or, better still, a few drops of fresh solution may be from time to time dropped onto the tip of the applicator by aid of a pipette, thus avoiding entirely what is certainly objectionable, and that is any interruption of the flow of the current.

The dispersing electrode may be held in the hand, may be held by the operator upon the cheek or beneath the lower jaw, or placed upon the chest or back, or, in short, anywhere at a reasonable distance from the active electrode. The latter, the active electrode, is to constitute a positive pole, and the former a negative pole. To determine the polarity, apply a few drops of a saturated solution of iodide of potassium to a piece of paper and test the two terminals of the cords; free iodine will appear at the positive terminal and cause an iodine stain. Or test in the same manner by aid of a piece of litmus-paper wet with water; the positive terminal will turn the paper red, the negative will turn it blue.

Everything now being ready, the connections tested and polarity having been carefully determined beforehand, the current may be "turned on" most gently and gradually.

In the case of sensitive dentine, skill, carefulness, and experience are essential. The first onset of the current may at the best cause a slight burning pain. To avoid this contingency, it is well to give the solution five minutes' time to effect a superficial anesthesia prior to applying current. The applicator is adjusted, and the current, which cannot be too gradually applied, is then brought into circuit. The patient will feel a slight burning sensation, which in a moment will subside, when more current may be added. Each accretion of current during the first five minutes will cause the same sensation. Thus the treatment is followed up, step by step, consulting the patient as to the slight pain, until, in about five to seven minutes' time, it will be found that the current strength may be largely increased without causing any sensation whatever. At this time I carry the current up to from two to two and one-half milliamperes, and, after two to three minutes at this current strength, consider the dentine sufficiently benumbed to endure operative procedures without pain. A point of prime importance is to avoid movements or removal of the applicator during the current flow; for, as is well known, a "steady" current produces no reaction of motion or sensation, while a "varying" current produces these reactions most unpleasantly to the patient.

With these hints in mind and with a little experience, not only dentine, but the contents of the pulp-cavity, and even the tissues outside of the tooth, may be effectually anesthetized via the pulp-chamber. And it may be mentioned in passing that not only may anesthetizing substances be thus employed, but also any other remedy—germicidal, antiseptic, escharotic, etc.—which it is desired to apply to the tissues above named.—*Dental Cosmos.*

## EDITORIAL

Not long ago we were asked why it was that so many dentists, including some U. of M. graduates, were unable to make their occupation a financial success, and several cases were cited of men who are undoubtedly thoroughly proficient in their profession, but who as business men are sadly wanting. This is a question which each student should give special attention, for success depends not only on the practice established but upon the thorough business methods of the practitioner—his ability to collect his bills and promptness with which he liquidates his debts. It is an old saying that the professional man is impracticable in money matters, though why this should be it is difficult to say, for the practice of any profession is as much a business as the selling of any of the world's products, and subject to the same rules of supply and demand. Of all men engaged in active professional pursuits the dentist should be the most perfect business man, for not only is more of his time necessarily given to each individual patient, but expensive material is consumed in nearly every operation, the bills for which he must promptly meet if he would maintain his financial standing. May not the laxness of business principles in many dentists be due, in part, to the habits formed in college days, when there is seemingly no reason for the display of commercial ability, the money matters of the average student being confined to expenditures necessary for his education and comfort, and of which, generally, no very strict account is kept. The habits formed while in college undoubtedly remain with a person after his entrance upon the arena of the world's warfare, and the student who is indifferent or careless about contracting debts will be the one whose note is apt to go to protest, not, perhaps, because of any desire to defraud his creditors, but because of negligence and lack of proper business methods. Another reason why many practitioners are not a success, financially, is because of a repugnance in sending bills, when due, for services rendered. No dentist should feel it inconsistent with his professional dignity to call in person, if necessary, for the collection of a monthly or quarterly account, and a specified time upon which to mail or deliver statements to each person indebted to him should be part of the dentist's routine work. An elaborate set of books is not necessary for the accounts of the average practitioner, perhaps the more simple the system the better, but if every operation, however trivial, is tabulated, bookkeeping soon becomes a habit, making it easy to keep each individual account, and at the same time force the dentist into methodical and precise business habits which will augment not only his income but gain for him the confidence of the representative business men of his community.

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SEVERAL members of the Senior class who are Canadians by birth have lately been corresponding with the Secretary of the Dental Examining Board of the Province of Ontario relative to the legality of practicing in that colony with a U. of M.

diploma, and have received in reply to their letters the statement that before being allowed to practice in the Province they must attend three years' lectures at some Canadian dental college. While the JOURNAL is heartily in favor of legislation to protect the people from dental quackery, this action on the part of our Canadian cousins seems to have been taken more in a spirit of jealousy and animosity than in a desire to place the profession upon a basis of liberality and unity. When it is taken into consideration that young men come from every part of the world to study dental science at Ann Arbor, and that most European countries receive our graduates with open arms, this attitude on the part of the Canadians is not only unjust but is belittling to the men who are responsible for the enactment of this law.

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THE editor of the *Dominion Dental Journal*, under the title of "Halt," publishes a lengthy editorial in the March number on the congestion of the dental profession in Canada and appeals for a curtailment in the number of students graduated by the Canadian dental colleges. Evidently our Provincial brother has forgotten that the idea of the survival of the fittest is the only known method by which the profession can hope to grow and develop.

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THE Freshmen are to be congratulated for the records made by the '98 men in athletics this year. The JOURNAL is proud of them.

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## DENTAL LAW IN CANADA.

THE following letter received by a member of the present Senior class explains not only why Canada is losing some of her best young men, but also gives an idea of the narrowness of our Provincial brethren in relation to American dental colleges:

DEAR SIR.—In reply to yours of 29th inst. I have to say, that, assuming you are a citizen of Ontario, to qualify as a dentist in this Province you will require to matriculate in the Royal College of Dental Surgeons of Ontario, sign indentures as a student of Dentistry with a licentiate for three and one-half years, attend three courses of lectures in the R. C. D. S. and pass all the prescribed examinations. In other words comply with the full curriculum of Ontario. If, however, you attended one course of lectures in Ann Arbor before March 25th, 1893, when the law here was changed, you will require to matriculate in the R. C. D. S., attend one full course of lectures and pass a final examination in all the subjects of the second and third years. Yours very truly,

J. B. Willmott,

Secretary Royal College of Dental Surgeons.

P. S. Our Board is not now offering any inducements for the dental students of Ontario to take their professional training out of the Province.

## MICHIGAN STATE BOARD OF EXAMINERS.

The next meeting of the State Board of Examiners in Dentistry for the State of Michigan, will be held in the City Council Chamber, in the City of Saginaw, E. S., on Tuesday, May 5th, 1896, at 10 o'clock A. M.

All "temporary licenses" expire on above date and cannot be renewed.

"Graduates of Dental Colleges, with a course of instruction and practice fully equal or equivalent to that of the College of Dental Surgery of the University of Michigan" can be registered by furnishing the necessary affidavit, and paying the fee, $3.00. All others are required to pass an examination before the board.

Applicants for examination must furnish instruments, including dental engine and sufficient gold for one or more fillings. By order of the board.

Frank O. Gilbert, Secretary.

Bay City, Mich., March 28th, 1896.

## MICHIGAN DENTAL ASSOCIATION.

The Fortieth Annual Meeting of the Michigan Dental Association will be held in the city of Grand Rapids on June 10, 11 and 12. It is hoped that a large attendance will be had, and from present prospects it will be the most enthusiastic meeting held for years.

B. H. Lee, D.D.S., Secretary.

J. Ward House, D.D.S., President.

## THE NEW CALENDAR.

The new Calendar for the college year of '95–'96 has just been issued. In its pages we find a new and complete list of graduates with their locations (so far as known) including the class of '95. A copy will be sent to each alumnus before the close of this year and it is hoped if there are any omissions or errors notice will be given at once.

## BOOKS RECEIVED.

*Electricity in Electro-Therapeutics.*—By Edwin J. Houston, Ph.D., and A. E. Kennelly, Sc.D. New York: The W. J. Johnston Company.

This little book is intended to meet an evidently growing demand, not only on the part of general medical practitioners, but also of that of the general public for information respecting such matters in the physics of electricity applied to electro-therapeutics, as can be readily understood by those not specially trained in electro-technics.

*Catching's Compendium of Practical Dentistry*, 1896.—By B. H. Catching, D.D.S. Atlanta: G. Franklin, Printing and Publishing Company.

This valuable review of all that is interesting and instructive in dentistry for the past year is now on sale and should be in the hands of all dentists, and especially in the libraries of the young men about to leave college. A new feature has been added to the Compendium this year—Science in Dentistry—making the work a complete one in every detail.

## ALUMNI NOTES.

Dr. Milton T. Watson, '93, of Bay City, spent March 30th at the college.

Dr. Mason Moyer, '93, of Dundee, Michigan, called at the college on March 31.

Dr. R. D. McBride, '93, has resigned his position as lecturer on crown and bridge-work in the Detroit Dental College.

Dr. J. Austin Bucknall, '95, of Detroit, spent April 26th in the city visiting college friends.

A report reaches us that a son was born to Dr. and Mrs. E. L. Gedney, members of the class of '94.

B. T. Ruthruff, D.D.S., '95, of Huron, Ohio, visited the college and Ann Arbor friends last month.

A recent letter from Dr. G. W. Collins, '94, of Vermillion, South Dakota, tells in a general way of his prosperity.

The report that Dr. Fred Sizelan, '90, of Muskegon, was to leave that place for London, England, proves to be false.

Dr. F. D. Wilson, '81, of Omaha, Nebraska, is visiting with Dr. Dorrance for a few days, before leaving for Atlanta, Georgia, where he will locate for the future.

About March 27, Dr. Walter J. Bell, '92, of Ishpeming, Michigan, spent three days in the city. The death and burial of his sister was the cause of his stay here.

Geo. A. Servis, D.D.S., '94, formerly of Standish, Michigan, has purchased the practice of Dr. F. A. Kotts, Manchester, Michigan, Dr. Kotts having located in Toledo, O.

Because of weakness of his eyes, Dr. A. W. Diack, '92, has discontinued his course of lectures on Dental Materia Medica for the present year, at the Detroit Dental College.

During the early part of March, Dr. D. N. Swift, '94, of Buchanan, Michigan, was called for a few days to this city by the death of his daughter, aged 15, who had died of congestion of the lungs.

Dr. Clarence F. Piper, '95, of Toronto, Ontario, made a few days' visit about the college and in the city on April 26 and 27. Dr. Piper has taken the examination at Toronto for admission to practice in the Dominion, but will not know until in early May whether he has been successful or not.

Dr. Abban V. Elliott, of Florence, Italy, who was president of the class of '81, has been recently elected to the presidency of the "Societa Dentistica Fiorintina." Dr. Elliott has been a regular subscriber to the JOURNAL since its establishment in '92, and it is with pleasure it makes note of this honor conferred on him. Eastward the course of American ideas take their way.

## DEPARTMENT NOTES.

J. P. Collett, '96, will practice at Celina, Ohio.

A diploma was conferred upon W. P. Winning April 10.

C. L. Sherwood, '96, has decided to locate at Titusville, Pa.

E. W. Brown, '96, expects to practice his profession in Saranac, Michigan.

J. M. Duffy, '98, won the hand walk and the hurdle race in the 'Varsity indoor meet.

C. K. Medler, '98, underwent a minor surgical operation during the spring vacation.

Work on the ladies' gym. is being rapidly pushed, the foundation being already in place.

Dr. Watling lectured to the Seniors on the evening of April 8 upon the subject of "Extraction."

A. H. Kimmond, '98, has been selected as one of the catchers for the 'Varsity base ball team.

Miss Jennie Bailey, a Sophomore Medic, has changed to the Dental Department, entering the Freshman class.

A. W. Schurz is a late entry in the Junior class. He comes from the Medical department of the Northwestern University.

Most of the commencement invitations have been received by the chairman of the invitation committee, H. J. Livingston.

F. M. Bacon, '96, will occupy an office in Port Huron during the summer. Whether he will stay longer he has not yet fully decided.

The Seniors and Juniors are busy preparing their papers to be read in Dr. Taft's lecture hour, he having given out subjects last month.

The Freshman class, under Dr. Haidle, has completed its first course in the laboratory and has now taken up crown and bridge work.

Since our last issue B. T. Hunt, J. W. Lyons, W. H. Buttolph and E. V. Deans, all of the Senior class, have recovered from attacks of parotitis.

The last class in dissection is at work in the anatomical laboratory. The spring course compels attendance on Saturdays and every day during the spring vacation in order to comply with the state law which prohibits such work after May 1.

During the spring vacation the chimney in the demonstration room was overhauled, thereby improving the draught for the Land furnace.

Through the kindness of Herman Printz, '96, we are enabled to print a translation of "Chlorate of Potash as an Antiseptic," by P. G. Unna, M. D.

Mr. Sheldon, a former student of our department, and now a member of the class of '96 of the Detroit Dental College, made Ann Arbor friends a visit in March.

A. H. Kinmond, '98, had the misfortune recently to receive a broken nose, being struck in the face by a wild ball as he was watching some students practice in the Gym.

Lambda chapter of the Xi Psi Phi fraternity was organized in Chicago the first of March by C. F. Fitch, '96, assisted by Drs. G. F. Fiddyment, '95, and O. F. Ingalls, '92.

Several students of the department passed their spring vacation at Whitmore Lake and their veracity must not be questioned when they tell of the fish they caught.

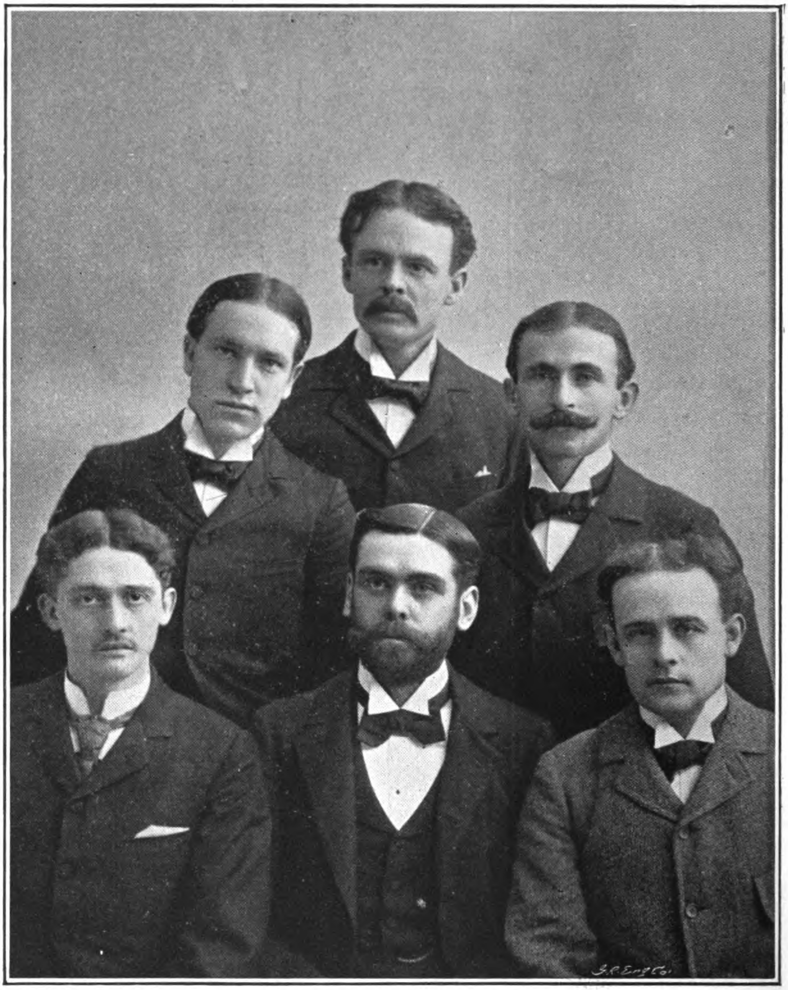
The Seniors have decided to have a class album instead of a group picture. The album will have six faces on each page and will be a valued souvenir to the members of the class.

Dr. Watling has commenced marking the Seniors on their operations, and a standard of seven and one-half of a possible ten in thirty gold fillings must be reached by the aspirant for a diploma.

C. F. Fitch, '96; J. C. Blair, '97; C. E. Pease, '98, and C. F. Steinbaur, '98, were with the Glee, Banjo and Mandolin Clubs on their trip during the spring vacation, going as far west as Salt Lake City.

The class of '98 has a ball team in the field which is bound to do good work. R. N. Forbes is the manager. The JOURNAL wishes the team all possible success and hopes the nine will be as victorious as the relay team has been.

At the last indoor meet at the gymnasium the dental relay team, composed of A. H. Kinmand, L. N. Burke, R. N. Forbes, and J. M. Duffy, all of the class of '98, won the trial relay race from the '99 Lits in 57 3-5 seconds; from the '99 Medics in 57 seconds; from the '98 Lits in 57 1-5 seconds, and from the '98 Laws in 56 1-5 seconds, in the last lowering all previous records.



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# IMPRESSION MATERIALS, AND HOW TO USE THEM TO ATTAIN THE BEST RESULTS.

BY C. A. DEVLIN, '96.

It is not the intention of this paper to go into detail in regard to all of the impression materials which are in use at the present day, but rather, that one which is without doubt the best, and which is most universally used, namely, plaster of Paris.

It is said, and most truthfully, that a perfect impression and a correct articulation, constitute the basis of prosthetic dentistry. On no other basis can a denture be constructed, which embodies the highest ideas of utility and beauty. Given an imperfect impression, the most accurate workmanship avails little or nothing, and the most artistic mechanism is all the more disappointing to both patient and operator. As it is the intention of this paper to deal with plaster of Paris, and plaster impressions, it will be well to approach the subject in a systematic way.

Let us first consider what the essential qualities are in a good impression material. There are two principal ones: It should have the necessary softness for taking the impression, and the proper hardness for retaining its shape when being removed.

The essential properties are the following: It must take a sharp imprint, must remain where placed, must harden promptly, and when there are undercuts or dove-tail spaces it must either bend or break with moderate force. All materials must not only have these essential qualities, but they must be available under the conditions existing in the oral cavity; and besides, they must have no qualities which are repulsive to the patient.

The material must be soft enough to copy the finest lines of the mucous membrane, and at the same time must have that consistency which will compress, without displacing, the soft tissues. 'Remaining where placed' implies that the material must not only have no tendency to warp or fall away of its own weight, but that it must have the least degree of expansion or contraction. The property of hardening is as essential to the removal as that of softness is to the taking of an impression. When there are undercuts or dove-tail spaces no correct impression can be withdrawn without either bending or breaking; and any material must yield or fracture with moderate force, or too much pain and injury will be inflicted. As the taking of an impression is generally an unpleasant process, and sometimes not a little painful to the patient, it should be taken in such a manner as to give the least degree of pain and annoyance.

Materials: The impression materials in use are, wax, gutta percha, modelling compound, and plaster of Paris. The two latter materials have the greatest number of desirable properties, and are most extensively used, so let us consider plaster of Paris.

Plaster of Paris, or gypsum, is a calcium sulphate ($Ca SO_4 2H_2O$) which is prepared for dental and other purposes by being pulverized and calcined. Exposure to heat drives off the water of crystallization, which mixing again supplies, restoring the plaster to its original condition of solidity. It is claimed that if the proper quantity of water be taken, the plaster will be almost as hard as the original gypsum. Only the best quality of plaster should be used for dental purposes, and, as all its desirable properties are damaged by exposure to moisture it should be kept in a dry, warm place. Assuming that the plaster has been properly prepared and has not been exposed to moisture, there is one essential condition that must be complied with to obtain the best results: it must be properly mixed. Of the several methods of mixing plaster, that is best which most perfectly excludes or removes all air-bubbles, prevents expansion, and, when used for that purpose, gives the sharpest and smoothest impression. When mixing plaster, the following points, which anyone can easily prove by experiment, should be borne in mind: 1st, plaster mixed very thin or very thick, or stirred too long, will set soft and expand decidedly, an excess of water, plaster, or stirring, interfering with perfect crystallization; 2d, though coarse plaster sets hard, it expands too much for dental purposes; 3d, substances used to hasten its setting always soften plaster, and should be used for impressions only; 4th, plaster sets most perfectly and promptly in warm water. The best vessel to mix plaster in is a small bowl, for the reason that in such a vessel the mass can be stirred more quickly and thoroughly. The air which is always found in plaster should be freed before the latter sinks into the water. It is needless to say that this cannot be done by pouring the water on the plaster, but can best be accomplished by sprinkling the plaster into the water. Plaster will usually be found more or less packed in the can or barrel, and should first be loosened up to free the air from the mass, and then sprinkled into the water by tapping the spatula on the edge of the bowl, which may at the same time, and also while stirring the plaster, be jarred on the table. Sprinkle in the plaster till all the water is taken up, or, when sufficient plaster has been added, pour off the surplus water. The stirring should be brief, rapid and thorough.

As to the chemistry of plaster. Prof. Henry Leffman gives the following points: "The setting of plaster is a chemical process, the water being taken up in the proportion of two molecules to one of the calcium sulphate; that is, $CaSO_4$ becomes $CaSO_4 + 2H_2O$. The facility with which the combination occurs depends largely upon the care which has been taken in preparing the plaster. If it has been too highly heated, the power of taking up water is lost. The presence of impurities also of course interferes with the setting qualities. It is well known that many saline substances—e. g., common salt—hasten the setting, but the exact cause of this is not definitely known. In the case of common salt a double composition occurs to a slight extent, by which calcium chloride and sodium sulphate are formed. When a solution of the so-called liquid silex, which is sodium silicate, is put on a plaster cast, a similar reaction often occurs, forming sodium sulphate and calcium silicate, and the sodium sulphate appears on the surface of the cast in white moss-like tufts.

The hardening of calcium sulphate is attended by the production of heat and by increase of bulk. The best casts are, of course, obtained when the mixture with water is made thoroughly, so that every particle of plaster has an opportunity to absorb the proper amount of water."

Of the various substances that have been used to hasten the setting of plaster for impressions, common salt is the least objectionable and answers every purpose. From five to ten grains is the proper quantity for the average impression. To secure uniform diffusion, throw the salt into the water before sprinkling in the plaster. Salt hastens the setting, makes the plaster brittle, and, it is claimed, reduces its expansion, each effect being a decided advantage when taking an impression. If salt really prevents expansion, it is a most valuable addition to the plaster. The brittleness induced by salt lessens the amount of force required in fracturing undercut and partial cases.

Objections to plaster: Plaster is disagreeable or difficult to use in proportion as its qualities are disregarded or it has not been kept within proper limits. And, because it will not readily accomplish everything, some who have not used it properly, or but for a short time, seem inclined to replace it by the materials which, though apparently requiring less skill, are seldom or never so reliable. As many objections to plaster, and much prejudice against it, come from using it improperly, it will be necessary to enter into some, perhaps, apparently unimportant details in describing methods which secure the desired results with the least annoyance to the patient and the best chances of success to the operator. The too common plan of taking a cup that will simply enclose the ridge, paying no attention to the height of the palate, and piling the plaster high in the center, is a good way to choke the patient, spoil the impression, and furnish a strong argument against plaster. And having it mixed so thin that it will drop on the patient's clothing, or so thick that the parts cannot be imbedded, or using such a quantity that there is an overflow into the mouth and fauces, are mistakes that are certain to cause failure and loss of reputation.

A perfect impression and its tests: A perfect impression must have fullness, smoothness and sharpness. It should cover a little more surface all around than the finished base-plate; faithfully reproduce all the finest lines, and should be as smooth as the mucous membrane. The sharpness is required not only to attain the best adhesion, but to counteract as far as possible the blunting effect of cast-varnish. Smoothness is necessary to the health of the surfaces against which the plate rests. A full impression adheres to the parts it covers, either because the air is excluded from under it, or on account of alveolar undercuts, or because by being left in too long it has absorbed the moisture from the mucous membrane. The latter effect is generally due to ignorance or carelessness, and usually injures the mouth. The resistance which occurs from pressure of the atmosphere against the under surface of the cup, showing that the air is excluded above, can always be relied on as the *certain test of a good impression.* The resistance which is offered by an undercut can easily be distinguished from that of the atmosphere, and is nearly always felt after the latter has been overcome. Of course it is admitted that an impression which drops when touched or is detached with very little force may be so modified as to produce a plate with fairly good adhesion; but such an impression cannot be considered reliable in any case, and in difficult ones it is almost wholly worthless.

Methods of taking plaster impressions: The best attainable results with plaster are secured when the required quantity of properly-prepared plaster is placed in a cup exactly adapted to the case, and pressed up with the rear slightly in advance of the front. The only objection to passing up the heel of the cup in advance is the liability of confining air between the plaster and the palate. Theoretically this seems to be a strong objection, but practically it amounts to but little. And even when air is so caught, the defects appear on top of the rim, usually above the plate-line, being carried there by the outward flow of the plaster.

When the soft palate is too irritable to permit contact without retching, local or constitutional treatment should be resorted to before attempting to take the impression. Perhaps the best local treatment consists in manipulating the parts with a feather or with some suitable instrument. As a constitutional remedy some operators recommend bromide of potassium, which should be administered about an hour before taking the impression. Local applications of cocaine will also diminish the irritability of the parts. But even when the soft palate is sensitive, retching can generally be prevented by keeping the plaster on the hard palate, which is done by having a line or ridge of wax across the heel of the cup. The plaster can be kept in front of this line in most full, and all partial cases, thus copying the surface very little farther than it will be covered by the plate.

It is the writer's opinion, that if this method of protecting the soft palate, and at the same time keeping the plaster out of the mouth, is properly applied, treatment of any kind will very seldom be required. This method and its other advantages will be described in detail.

Special cases sometimes require such extensive cutting away of the rim or floor of the cups as to render them unfit for further use unless these parts are restored with wax or modeling compound. When necessary, never hesitate to sacrifice a cup if by that means a more perfect impression can be obtained. The rim of the cup must not be so high as to stretch or displace the soft parts connecting the cheek with the ridge. When the ridge is short or low, the rim of the cup must be narrow. The two worst faults a cup can have are to be narrow at the rear and too high in the palate. The ridge, or, in partial cases, the ends of the teeth, should always rest on or almost touch the floor of the cup, because in that way even a nervous hand can hold the impression steady. As a general rule, plaster should have least body or thickness where the parts are most yielding, in order to secure positive and uniform compression. In view of many ill-adapted cups in use, and the excessive quantity of plaster often employed, it is somewhat remarkable that serious accidents do not frequently occur in attempting to take plaster impressions. The most important rule that can be given for the use of plaster is this: *keep it on the cup.* In order to do this it must not be mixed too thin, the proper quantity must be taken, and its flowing or being forced into the mouth must be prevented. When introduced into the mouth the plaster should be so stiff that it will not drop from an inverted cup. When the cup is made to conform to the size and shape of the parts, the quantity of plaster, which is thus reduced to the minimum, is easily estimated. As the palatine portion of very few cups can be so bent as to conform exactly to the roof of the mouth, a wax impression of the palate should always first be taken, a layer removed to give room for the plaster, and a line left intact across the rear to limit its flow. In most undercut and all partial cases this wax palate must be securely attached to the cup by warming the adjoining surfaces with dry heat, and the plaster must be anchored to the wax by undercutting the latter and chilling it in cold water. If any of these points are neglected, the cup and the wax, or the wax and the plaster will part company, and failure will almost certainly be the consequence.

The advantages of a wax palate, given at length and in their proper order, are these: (1) It measures the height and gives the exact shape of the parts, thus enabling the operator to estimate the proper quantity of plaster; (2) it makes the taking of the palate a certainty, with the least risk of the plaster being pressed against the soft palate or falling into the mouth; (3) it aids in adjusting the cup, which should always be pressed up with the second finger in the center; (4) it secures uniform compression of the soft tissues; (5) by being scored and undercut it anchors the plaster securely to the cup. And, besides these advantages, this wax palate when softened enables the operator to remove the model and the impression from the cup together. Each of these is an important point, and the last is not least, since it is the only reliable method of separating undercut and partial cases. This simple and efficient method of taking all upper impressions, full and partial, needs only to be tested to be adopted, but all the points must be noted and complied with or it will not prove satisfactory. If the cup be prepared in this manner, there will be no occasion to use cups with movable palates to press up and anchor the plaster, nor will it be necessary to make dies and swedge cups for special cases.

The extent of the space between the cup and the roof of the mouth will determine the mode of procedure. If this space is less than one-fourth of an inch, place a strip of wax about half an inch wide across the heel of the cup; if the space is more than one-fourth of an inch, take a wax impression of the entire palate. In both cases make the wax quite soft, and, being sure that the cup is in proper relation to the parts, press up until the floor touches the ridge; remove and trim away from the wax a layer of about one-eighth of an inch to give room for the plaster. In all cases a ridge of wax two or three lines wide should be left across the rear. This, by running the plaster to an edge and limiting its flow backward, thus forcing it against the palate, constitutes one of the best methods that can be devised for compressing the soft tissues.

After preparing the cup and having everything at hand, some points remain to be noted and certain directions must be given to the patient. As already directed, note the condition of the oral secretions. It is almost always some advantage and often a necessity, to rinse the mouth with a solution of alum or salt. When the mucous membrane is soft, spongy, or diseased from the previous wearing of a plate, a tonic and astringent mouth wash should be used for several days or weeks before taking the impression.

Some operators claim that the patient should be directed to avoid swallowing while the cup is in the mouth, but it is probably better to say nothing in regard to this, as the mere mention of it would, on highly sensitive patients, cause an immediate and constant flow of saliva, and so render swallowing imperative. The breathing may be safely allowed to take care of itself. As soon as the cup is in the mouth request the patient to lean the body and head forward, and when the cup is in position to draw down the lip.

If the cup has the proper shape and the right quantity of plaster has been employed, it is not especially necessary for the patient to lean forward, but nothing can press the plaster against the ridge all around at the same time so evenly and positively as drawing down the lip. In addition to this, pressure with the fingers may be made at the front.

Never attempt to remove a full impression until the plaster will fracture without crushing. A partial impression may sometimes be started a little to loosen it around the teeth and enlarge their imprints before it reaches that degree of hardness, though there is generally a more excellent way. By pressing between the thumb and finger plaster that has just reached the fracturing-point, it will be seen that it can be easily crushed. To know when it is hard enough, test the plaster in the bowl, or, better still, the surplus which has flowed over the front of the cup, as this more truly represents the condition of that in the mouth.

When the cup is properly shaped place the plaster around its floor, making it thin on the palate, high on the corners, but highest in front; so that when pressed up the surplus will be forced over the rim and not back into the mouth. In this way the plaster is placed just where it is needed, and the worst annoyance to the patient is prevented.

The manner of introducing the cup into the mouth is the same as for other materials, but when using plaster more care is necessary to avoid displacing it with the lips or remaining teeth.

The mouth should be opened just wide enough to admit the cup and contents, so as to allow of its greatest lateral distension. This is especially necessary when the mouth is small and the jaw relatively wide. The right side of the mouth is pressed away with the corner of the cup, the left side distended with one or two fingers of the left hand, when the cup is passed in, and then with the second finger in the centre and the rear a little in advance it is forced up with firm and steady pressure, until increased resistance shows that the ridge has touched or almost touched its floor. Now request the patient to draw down the lip, or draw it down yourself, when pressure can be made with the fingers at the front above the rim of the cup. While the plaster is setting the cup must be held perfectly steady, the least movement being liable to damage the impression.

An impression usually hardens in three or four minutes. It should be so hard that it cannot possibly crush, but it must not be left in so long that by absorbing all the moisture it will adhere to the mucous membrane. As there is a degree of softness which produces the best impression, so there is a degree of hardness which allows of the easiest and safest withdrawal. As before stated, the most reliable test of a perfect impression is the resistance to its removal. Many full upper impressions will adhere with decided tenacity, and will sometimes resist even forcible attempts to dislodge them. Though a plaster impression when set must be removed promptly to prevent its adhering to the membrane, yet nothing results from too much hurry or from applying an undue amount of force, except pain to the patient and damage to the impression. By raising the lip and the cheek at the front and sides to admit air, and so break up adhesion, and at the same time elevating and depressing the handle of the cup by short rapid movements, the impression is easily and safely detached. In case of difficulty the air may be admitted at the rear of the cup by pressing up the soft palate with the finger or the end of a blunt instrument; or the patient may be directed to give a slight cough, which, by raising the soft palate, admits the air under the impression.

In some cases, which perhaps are rare, it will be necessary to detach the impression the moment it can be done without crushing; otherwise the moisture will be absorbed, and the membrane, by adhering to the plaster, will be more or less lacerated.

# SOME RECOLLECTIONS OF THE CLASS OF '96.

BY H. HILLMAN, '96.

To begin at the beginning, I suppose that most of us after having paid our matriculation fee and interviewed Dr. Hoff started out to explore the building with which we were afterwards to become so familiar, rejoicing if we got off without an entrance condition and growling and kicking if we did not. Then we stood around in groups and wondered about getting acquainted with our classmates and trying to pick out a congenial bench-mate.

After this came the assigning of benches and it was right here that we first became acquainted with Dr. Haidle. Then followed our introduction to the various dental supply agents and the purchase of our freshman outfit and the arrangement of the same.

In a surprisingly short time we had settled down to the steady routine of work as laid out on the schedule. And perhaps the most memorable thing about the first few lectures was the kindly way in which the juniors sought to make us feel at home. I refer to the pleasant custom of "helping" the freshmen to their seats. We all remember seeing some poor belated freshman stealing on tip-toes to his seat and fondly hoping to get there unobserved, but he was always quickly caught sight of and vigorously "helped" by a score or so of obliging juniors, and when at last he got to his seat covered with confusion and dropped into it with a sigh of relief he was usually almost lifted out of it again by the resounding thump which ended the interesting performance.

And when in return we tried to "help" a junior in a similar manner we were often beautifully fooled at the last moment by his clever feint of dropping into his seat and then immediately straightening up and quietly dropping down after it was all over. But we were not caught that way more than once or twice.

They also had a way of greeting any tardy member by a shower of shouts, such as, "There he is—that's him!" "We knew he'd come!" This too, to a modest and retiring man was sufficiently embarrassing for the first two or three times at least.

Our first few weeks work on taking impressions will be remembered, and especially the time we had when we came to the plaster, the variety of attitudes and expressions to be seen were truly striking. In the demonstration room we grew better acquainted with Drs. Hoff and Haidle every week and got many good points from their skillful manipulations.

From the beginning we were kept busy both in the laboratory and the lecture rooms and most of the time was given up to real hard work varied by an occasional joke in the lab, or the "pulling a man up" in the lecture room, till, almost as a surprise we found ourselves preparing for the end of the semester. And soon our first "star chamber" in osteology was passed, then the final written exam in general chemistry, and the first semester was over.

The second semester to most of us, I suppose, is remembered as the period of hardest work in the course and in it dissection, histology and qualitative chemistry took prominent places, but this too passed very rapidly and the first long vacation came around bringing with it the end of our freshman year and a well-earned leisure.

Our coming back as Juniors was a very pleasant reunion and very few of the original number were missing. Besides renewing our acquaintance with Drs. Hoff and Haidle we now made the acquaintance of Dr. Hall in his interesting and instructive course in Dental Anatomy. And it was not till now that we really came to know and appreciate Dr. Dorrance, his genial disposition and his wonderfully skillful fingers will never be forgotten, his handling of wire especially always seemed to us to smack of magic. This year is also marked by our first lectures from our worthy dean, Dr. Taft, and it was now that we began to feel that we were really dents and not more than half medics. The only course for which we had to leave our own building this year being that of Physiology. During the first semester of our junior year occurred the memorable rush with the freshmen which resulted in the carrying away of the lecture room doors and of considerable damage to the plaster in the neighborhood, and also in a class tax for the repair of the same. But there is no doubt that the freshmen were much benefitted by their defeat and should in justice have been assessed for the repair of damages.

The interesting course in bacteriology which closed with the end of this semester was much marred by the brutal way in which we were compelled to stand around in a bare hall for two or three long afternoons waiting for our star-chamber, and all for lack of a little consideration and forethought on the part of the professor who had charge of that course.

In notable contrast to this mode of management, or rather, of mismanagement, was the careful and thoughtful way adopted when the time came at the end of the year to take our final star in physiology. It was held under the old hickory tree just beside the Medical building and each one of us was given a card with the day and hour of our appointments noted on it, and considering the large size of the class these were kept with wonderful accuracy, and the members of the class were thus saved a great deal of unnecessary anxiety, annoyance and loss of time.

This was the last act of our junior year and the class quickly dispersed to meet again in October as Seniors.

Almost the entire class returned with the addition of several members from other colleges. We found Messrs. Bigelow, Bush and Roberts right on hand to greet us as usual, and very glad to see us. After selecting our chairs and buying our Senior outfit we soon got acquainted with Dr. Watling and his little sharp-pointed instrument and his equally keen criticisms, which, though no doubt intended to be strictly flattering and confidential always seemed to us to be spoken in a voice loud enough to be heard at Ypsilanti, but even this was more than compensated for when he shoved in his mirror and passed on without a word, or, better still, with a "Well done, go ahead." We were also glad to renew our acquaintance with Dr. Hall and to find that Dr. Neeley had returned to assist in the operative clinic.

Our first struggles with leaking dams and gold that "wouldn't stick" were a good deal aggravated by the short winter afternoons and the total lack of any adequate artificial light in the operating room. We were led to hope that this lack would be supplied during the Xmas vacation but the improvement was so slight as to be hardly worth mentioning, and we were all glad when the days began to grow longer. Mr. Purfield, popularly known as "Henry," who always "wanted the room" in our other years was very accommodating this year to those who happened to be occasionally belated owing to a long and difficult filling. It would be hard indeed to find a person to fill his position as efficiently as it is now filled.

Our first intimation of the rapid passing of our last year was the agitation of the subject of a class picture early in the spring. A class cane had been decided on and purchased early in the year. The picture question was finally settled after much discussion by deciding on the framing the single photos in a large frame as had been done by former classes, instead of a group picture as was suggested. A class album was also contracted for so that each member could purchase one and so save the expense involved in exchanging photos.

Dr. Watling's exceedingly instructive and practical lectures ceased with the Spring vacation with an interesting and exhaustive talk on "Extracting."

The beautiful days of May and June slipped very rapidly away and one morning we found Dr. Hoff calling the familiar roll for the last time.

No more shall we hear the well-known roll call, Argetsinger, Arnold, F. C., J. C., Bacon, Bailey, Bass, E. W., E. D., and so on down the list.

No more will Bass answer "present" from somewhere out by the fountain; Bucks "pretty bird" will be heard no more; Sheridan will be more than "twenty miles away;" Ross and his box will depart from the old familiar spot, and the class of '96 will in all probability never come together again.

This short article would be very incomplete without some reference to our only lady class-mate, Miss Jessie E. Castle, who has been with us throughout, and whose unfailing cheerfulness and good nature have won the respect and admiration of the whole class.

These are but a few of the recollections of the class of '96; no doubt every member will long remember and recall many pleasant incidents which will help to keep a warm corner in their hearts for the U. of M. and especially for the faculty and members of the class of '96.

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The Ann Arbor edition of the *Headlight* has just been issued. It is replete with illustrations of college buildings, fraternity houses, residences and professors, and makes a beautiful souvenir.

# GALVANIC ACTION BETWEEN GOLD AND THE BASE METALS USED FOR FILLING TEETH.

BY J. P. COLLETT, B. S., '96.

ONLY within the last decade has there been any attention paid to the galvanic or electro-chemical relations of filling materials to each other and to tooth structure, the existence of such relations having been previously ignored. And today we find some men of prominence who are prone to believe that galvanic currents have little, if anything, to do with causing decay about fillings, while others are equally as certain of the evil effects of galvanic action. Out of this confusion of ideas and teachings, we must trust to science to bring harmony, to cause principles to be recognized, and the strong walls of prejudice to be broken down.

What we most desire to know is, "What are the conditions requisite to produce the best results with any or all the materials with which teeth are filled?" Aside from perfect workmanship, success or failure is the result of law; conditions and combinations determine the end.

There must be adaptation of special materials to different conditions of tooth structure; now how best use these? The introduction of any filling material which is a good conductor of the galvanic current introduces an element of electrical disturbances as true to law and as positive in results as when a copper and carbon plate are immersed in a cell containing the proper fluids for producing galvanic action. As far as tooth substance is concerned the evil disturbances must be in proportion to the galvanic disturbance, and whatever the result may be it is in accordance with natural laws, a knowledge of which will greatly aid the operator in applying the material best calculated, all conditions considered, to give the best results.

We may learn from observation and practice that teeth of normal structure and density under favorable conditions and, when properly filled with gold, may last a life-time, thus defying all the agents of decay. Unhealthy or abnormal secretions, lodgments of food, and acids produced by fermentation, lack of cleanliness, excessive use of acids, etc., produce, or generally lead to, decay. Aside from these agencies there are two other causes that produce secondary decay. The first is a deficiency of the elements (phosphates and carbonates) which in a degree render dentine a non-conductor. The second is defective manipulation of filling material, which admits moisture between the filling and the walls of the cavity. Primary decay depends on the quantity of electric fluid passing, while secondary decay depends on nature and quantity of agents set free by the former.

Through the agency of galvanic decomposition of food fluids in the mouth, and organic constituents of tooth-substance, there is an increase of acids above that which would occur with non-conducting fillings. But teeth of normal structure are never decomposed by true and simple electrolysis. Changes in structure must occur before decomposition can take place, and these changes are produced when the teeth are subjected to the action of acids, which remove the non-conducting carbonates and phosphates; the remaining organic matter is a conductor, and like organic compounds is decomposed by the galvanic current. Acids eliminated by such conditions react upon the lime constituents of the teeth, thus promoting the decay.

Metallic fillings under favorable circumstances add a new element or factor for the increase of acids. The filling of any conducting material forms the negative element, while the organic constituents of the tooth-structure make up the positive element. Dentine, when dry, is a non-conductor, but in the condition in which it is always found in the mouth is a conductor by reason of its organic structure and the presence of moisture. The decomposing effects are in proportion to the strength of the current, which is increased or decreased by the distance between the positive and negative elements. The feeble currents require time in proportion to their weakness.

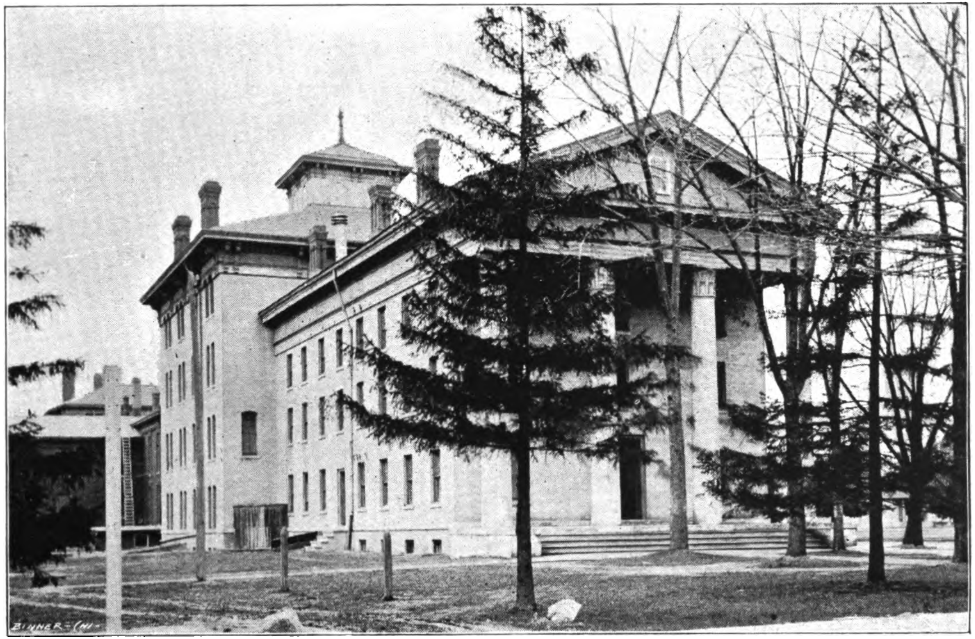
A filling of gold and amalgam in absolute contact, and in the same cavity, produces no appreciable current; the action is limited to the filling alone, just as when the poles of a battery conveying a current are put together. But intolerable effects may arise from fillings of different metals in opposing teeth; as for example, a gold filling in the occlusal surface of a lower right first bicuspid and an amalgam or tin filling in the occlusal surface of the upper right first bicuspid, the fillings so situated that they come in contact when the mouth is closed; thus producing polarization and depolarization each time they are brought in contact and separated, shocks being produced at each depolarization.

"The galvanometer shows that a gold filling can not be so separated from any amalgam filling in any distant part of the mouth, though in the opposite jaw, as to avoid a current, which current if quite feeble does no harm." But we would detect a current in the mouth if the gold filling were not there. Hot or cold drinks cause a change of temperature in different parts of the oral cavity; this produces a current. The breaking down of fluids, secretions, foods, etc., in the mouth also produce like currents. There can be no fixed rule to determine the exact space to observe between fillings. If necessary to fill teeth that occlude, better by far do so with the same metal.

Polarity is not a fixed condition but is determined by the relation of the liquid to the metal; as a filling so situated that one portion comes near the gums, and the other border near the occlusal surface of the crown of the tooth, we find that that part nearest the neck of the tooth is positive, and the part most distant from the neck, negative. Tooth-substance being negative and metals for filling positive, a current is induced, and the acids, etc., in the mouth being decomposed, assist decay by acting in their nascent state; as water, sodium chloride, potassium chloride, ammonia, and sulphuretted hydrogen, which are found in the mouth and readily decomposed by the current. The metals of the salts, etc., go to the negative while the remaining part of the salts go to the positive pole, as H to the — while O goes to the +.

All metals take the same direction when separated from the corrosive elements by electrolysis, and the corrosives such as chlorine, fluorine, and sulphur follow the example of the oxygen, corroding the metal if it is oxidizable and thus finally stopping the current until the oxidized part be removed, when galvanic action begins anew.

It is a well-known fact that nascent chlorine takes hydrogen from almost any compound containing it. It will therefore take hydrogen from water, forming hydrochloric acid at the positive pole. And this is why we so often see the most common varieties of dental caries about the margins of the base metal fillings, this decay being always the result of the action of hydrochloric acid. Again, nascent hydrogen at the negative pole, or gold fill-



THE MEDICAL BUILDING.

ing, takes chlorine from compounds containing it and also overcomes the affinity of a part of nascent chlorine for the positive pole and hydrochloric acid is again formed and we find the same variety of decay about the gold filling.

Ammonia being composed of nitrogen and hydrogen, if present, is also electrolized and hydrogen, being electro-positive, the nitrogen goes to the negative pole and there in its nascent state finds oxygen also nascent; combination takes place, nitric oxide being first formed which in the presence of air and water is rapidly changed to nitric acid. "It is on this principle only that the white variety of dental caries is ever formed as a result of galvanic action within the mouth."

It will be readily seen that we may have these different agents acting in harmony to produce decay, and as they have no effect, or action, with the gold filling, they spend their entire force on the nearest tooth-substance, hence the greatest decay about the gold filling. This, to many operators, proves that base metals are better filling materials than gold, reasoning from the standpoint of preservation of tooth-substance and not appearance and cost.

The quantity of current is in proportion to the amount of surface excited or exposed. Other things being equal, the decomposing power varies inversely as the square root of the distance between the surfaces. For example, two teeth, one filled with gold, the other with amalgam or tin, are situated in the lower right maxilla and one-quarter inch apart. The power of the current is twice as great as it would be if they were one inch apart and this power is increased four fold if they are but one-sixteenth inch apart. Of the substances dissolved, each component part goes to the metal whose electric state is the opposite from its own. Chemical action is the factor to be guarded against, and in filling teeth we unite the material used with a substance which is composed of an alkaline base combined with organic parts of tissue, all bathed in a chemical fluid of no definite composition or stability. Teeth vary in their power of resistance to corroding agents, some being considered not sufficiently dense to be non-conductors of galvanic currents; for example, a tooth filled with gold which admits the least bit of moisture between the filling and the walls of the cavity. The organic matter of the dentine is a conductor and the more so by the additional mixture. Galvanic action is set up between filling and tooth and we have hydrochloric and nitric acid decay, which soon entirely loosens the fillings.

Value of filling materials varies from gold to copper amalgam, varying according to their conductivity and difference in oxidation. Copper amalgam, by hyperoxidation and deoxidation of the copper, refills the decalcified part or structure with a sulphide and thus forms an indestructible compound of the same polarity as the filling, and all galvanic action ceases. Gold combined with tin, or tin alone, and the various grades of amalgam rank between gold at one extreme and copper amalgam at the other, all of which impart to poorly-calcified dentine more or less antiseptic properties, the gold furnishing the least.

A filling composed of gold and tin or of gold and amalgam produces a marked change in the base metal, it being rapidly oxidized, which is unsightly, but makes it the better antiseptic, the galvanic action ceasing as soon as the surface is oxidized. The gold is the — pole and the amalgam or tin the + pole and because of contact, the current is confined to the two metals.

Fillings of base metals and gold may be worn in the same tooth if sufficiently separated or united. The dental tubuli are excellent conductors, and opposite fillings on opposite sides of the tooth are very likely to cause death of the pulp in course of time, or, at least constant trouble. Proximal fillings should be of the same metal, otherwise a few meat fibers, etc., may collect between the teeth and the current is carried from one filling through the dental tubuli to the pulp through bone and tissues of maxilla to, and through, the pulp of the opposite tooth, then through the dental tubuli, to filling, and by the meet fibers, etc., over to, the starting point, thus forming a circuit that in time causes the death of the two teeth so affected. But if it is desirable to insert a gold filling opposite an amalgam and the distance be one-sixteenth inch, or less, the condition of the dentine must be taken into consideration. If preparation of the cavity causes no pain the tooth-substance is usually of a sufficient density and no other preventative is needed than a coat of very thin sandarac varnish. Deep pits are quite objectionable as they bring the gold anchor points often quite near the pulp and cause continued irritation in many instances.

Some authors claim that teeth are rendered more comfortable, secondary decay less frequent, and fillings are retained longer by using some insulating material between the filling and the entire extent of the walls of the cavity, under the following conditions: when the dentine is sensitive or poorly calcified, and when decalcified tooth-substance is left in the cavity as a capping for the pulp. Substances most used are chloropercha, waxed tissue paper, thin sandarac varnish, oxychloride, oxyphosphates, and dammaar varnish. This latter is by far the best, as it speedily concretes into a very hard resin. The space occupied is very minute, if any, it being taken up in filling the tubuli and scratches made by instruments used in excavating. Otherwise uninsulated gold, amalgam, or tin fillings may cause intense facial neuralgia which is cured only by the removal of the fillings.

In volume IV. of the Missouri Dental Journal we find a comparison of conductivity of materials:

| | |
|---|---|
| Silver, | 100 |
| Gold, | 60 |
| Tin, | 30 |
| Living dentine, | 25 |
| Lightly amalgamated dental alloy [100 alloy to 50 of Hg.]. | 20 |
| Osteo-plastic, | 18 |
| Dead dentine, | 15 |
| Hill's Gutta Percha Filling, | 13 |
| Heavy amalgamated dental alloy [100 alloy to 100 of Hg.]. | 10 |

From this table we can see that either of the materials united to the one below it will cause a current if distance and conditions are favorable. It has also been found that the higher polish a filling has, the current is lessened in proportion, and if the filling is rough the current is correspondingly increased.

So we see that workmanship, filling material, tooth-substance, conditions of the oral cavity, and a knowledge of the laws of galvanic action all have a part in attaining perfection in operative dentistry.

# TIN FOIL.

BY STANLEY AMMON FARNUM, '96.

Tin is a comparatively rare white metal harder than lead and very malleable. In ductility and tenacity it is inferior to most of the other malleable metals. Its specific gravity is 1.2 and it melts at about 442°. It may be beaten into leaves one two-thousandths of an inch in thickness, the ordinary tin foil being about one one-thousandth of an inch thick.

About twenty years ago there was considerable dissatisfaction in the use of it. When it came from the manufacturer it looked fairly bright. After being used and exposed to the air it assumed a light brassy color and lost what integrity it formerly possessed. But as it now comes from the manufacturers in sheets of various sizes and thickness it is an easy matter to insert a filling beginning at the base of any cavity and with mallet or hand pressure produce a compact mass that can be cut or filed the same as a gold filling.

Tin coheres, adheres, or welds and makes a solid filling with less malleting than gold requires, for if over-malleted the receiving surface is injured. The extra tough foil now manufactured retains a bright surface and does not lose its good qualities even after considerable exposure. Tin of this kind, well condensed with mallet or hand force, stays up against the sides of the cavity and makes a tight filling, probably expanding and contracting less than gold and gives a surface which will wear for five or ten years, depending upon the size and location of the cavity. It is used considerably and to great advantage in filling many cavities in temporary teeth and also as temporary fillings in the permanent teeth. Children stand it well because it can be done quickly and does not require as much malleting as gold.

Up to the age of fourteen or fifteen we find many teeth which are chalky, and with the fluids of the mouth in such a condition that oxychloride or oxyphosphate do not last long, and for some reason amalgam and gutta-percha soon fail. In these conditions tin is good, even in the incisors, for, as the patient advances in years, the tooth structure generally becomes harder and more dense; then if desirable the filling can be removed and gold inserted instead. It is invaluable when you are limited for time and means, also for filling first molars where we so often find poor calcification and the teeth in a chalky condition. Tin not only arrests decay mechanically, but in frail, chalky structures, acts as an anti-acid element in arresting the electric current set up between the tooth structure and the filling material.

Sometimes the dentine beneath fillings which have been removed is considerably discolored and greatly solidified as compared to its former structure. This is more frequent under tin than gold. In many mouths tin oxidizes, while in others it does not, but retains its clear, gray color. The oxidizing color is very objectionable to some people but this is offset by the fact that the color fills the ends of the tubuli and often arrests further decay. In unhealthy mouths, with the secretions in an abnormal condition, the fillings are very rapidly destroyed by the action of nitric and hydrochloric acid. Such changes may take place so as to destroy them in a short time.

As we get it for filling purposes, it comes in sheets, just as gold, No. 10 foil being the one most used. Either cut this or tear in strips as is usually done and fold into mats or rolls. Tin does not need to be heated as does gold, but should be well malleted together. We have instruments for working this material the same as for gold. They usually have square ends and the serrations are a little coarser than those for gold, although the gold instruments are used sometimes to a good advantage, especially in small cavities, where it is impossible to use the ones intended for the material.

In working tin we should be careful and have absolute dryness using as much care and caution as if we were working gold. We must not think because it is tin it will be all right anyway and hurry it through as soon as possible. No matter what kind of a filling an operator is putting in he should use as much care as in working gold, because a filling poorly done is worse than none at all, for the process of decay is going on underneath it when it looks all right to the eye. An operator should never proceed to introduce a filling until he has all the decay removed, for if he does, his operation is useless, and he is not doing his patient or himself justice.

A cavity which we expect to fill with tin should be nearly the same as for gold, only the retaining forms should be a trifle larger and if pits are used they also should be larger and deeper. In some proximal cavities between the molar teeth where they do not come through the crown you can use tin with considerable advantage without cutting the masticating surface, although it is advisable to cut through the crown in most cases. Great care should be taken to see that the tin is well condensed at the cervical borders in proximal and buccal cavities. The filling is finished nearly the same as gold, first burnishing it and then using corundum stones and in proximal cavities using the disc and emery strips and finally finishing with the burnisher. A filling of this kind should last for many years. Tin is also used considerably in cavities in combination with gold, partly on account of its cheapness, also for its working qualities and adaptability to cervical borders. Some dentists have advocated the rolling of these two metals together, claiming that fillings can be made quicker and are not as subject to thermal changes. Tin used this way will wear somewhat longer than when used alone. I have used tin in connection with gold in proximal cavities mostly, first placing the tin in the cavity and filling it from one-fourth to one-half full and then using gold over this, as tin prevents further decay at the cervical border better than any other metal or combination of metals. It will not do to place too much reliance on the union of the two metals to hold the gold in place but have some retaining form above the tin.

## EDITORIAL.

WITH this issue the present editors of the JOURNAL complete their work, and next Fall another Board selected from the student body will conduct the department organ through the troubled sea of journalism. While it has not been all play, still the thorough manner in which each and every member of the Board has performed his share of the labor incident to the publication of each issue, has made the work not only a pleasure but has developed a bond of sympathy and mutual regard between the members of the Board that many years will not efface. Never before has the JOURNAL enjoyed the financial prosperity this year has brought forth, due to the systematic and thorough attention of our Business Manager to the details. The Board wishes to thank the Faculty, students and alumni for their cordial appreciation of our labor, and with the sentiment constantly growing among our alumni of the work and scope of the JOURNAL, future Boards of Control have nothing to fear for the growth and prosperity of our department journal.

IT is with some regret that the JOURNAL notes the attitude our Faculty has taken in regard to base ball playing by the Dental students. While there is undoubtedly more or less risk involved in the participation of the great American game, still the advantage reaped from improved physique and consequent brain vigor, far overbalances the chances of loss of mobility of the fingers—the only actual hazard of the game. We, as a department, have gained an enviable position in the athletics of the University, and it can no longer be said of the Dental students that they take no interest in the various athletic games and meets of the campus. The winning of the inter-class championship by the Medical students would be an additional stimulus for our students to enter the field early next spring, but the action of the Faculty will again place our department in the oblivion sure to follow non-participation in the sports and games so dear to the college man.

THE movement on foot among the private dental colleges to force up the annual fees to a minimum of $100, under threat of expulsion from the National Association of Dental College Faculties, is hardly a display of generosity that one is apt to expect from the in-most-part-ethical gentlemen in charge of these private institutions. While the JOURNAL deplores the fact that our department is not self-supporting, and is heartily in favor of an increase in the amount of the annual fees to meet the deficiency, this plan of coercion on the part of the private schools is entirely out of place and, in the face of the facts, looks to be a thrust at the prosperity and growth of our dental school.

A STEP in the right direction is the establishment by the Board of Regents of a summer school of dentistry. This will not only permit students to make up work in the mechanical part of their art, but will enable practitioners to perfect themselves in the more modern crown and bridge work and in porcelain work. The course, which is as yet in its infancy, is bound to be a success.

## DENTAL SOCIETY MEETINGS.

THE annual meeting of the Michigan State Dental Association was held in Grand Rapids, June 10, 11 and 12. Following is the program:

### WEDNESDAY, JUNE 10.

2:00 P. M.—ORGANIZATION.

3:00 P. M.—PAPER.

"Absorption of the Roots of Temporary Teeth."

By A. W. HAIDLE, D. D. S., Ann Arbor.

Discussion opened by N. S. HOFF, D. D. S., Ann Arbor.

4:30 P. M.—PAPER.

"Points of Interest in the Care of Children's Teeth."

By B. J. DEVRIES, D. D. S., Holland.

Discussion opened by E. T. LOEFFLER, D. D. S., Saginaw.

7:30 P. M.—PAPER.

"What Should the Dentist Do to Save the Teeth?"

By N. S. HOFF, D. D. S.

Discussion by DRS. J. TAFT, JAMES CLELAND, W. H. JACKSON, E. C. MOORE and GEO. L. FIELD.

### THURSDAY, JUNE 11.

9:00 A. M.—PAPER.

"Examination of the Teeth Preparatory to Treatment or Filling."

By J. TAFT, M. D., D. D. S., Ann Arbor.

Discussion opened by E. S. HOLMES, D. D. S., Grand Rapids.

10:30 A. M.—PAPER.

"The Fate of Associations," by J. C. WALTON, D. D. S., Howell.

Discussion opened by A. S. METCALF, D. D. S., Battle Creek.

1:30 P. M.—CLINICS.

"New Process of Swedging Plates and Crowns."

Dr. J. C. PARKER, Grand Rapids.

"Adjusting Facing to Broken Bridge without Removing Piece from the Mouth." F. C. SIZELAN, D. D. S., Muskegon.

"The Use of Nitrous Oxide in Dental Operations."

E. R. JACKSON, D. D. S., Grand Rapids.

"Bleaching of Teeth by Use of Pyrozone." Dr. H. W. RAY, St. Joseph.

"Plate Work." Dr. J. F. Perry, Lawton.

4:30 P. M.—BUSINESS MEETING.

Election of Officers.

7:30 P. M.

"Personal Observation of the Development of Dentistry and Dental Legislation in Michigan."

By G. E. CORBIN, M. D., D. D. S., St. Johns.

"Dental Legislation." A. W. DIACK, D. D. S., Detroit.

Discussion General.

## FRIDAY, JUNE 12.

9:00 A. M.

"Dental Cataphoresis." By R. W. MORSE, D. D. S., Lansing.
Discussion opened by J. A. WHITE, D. D. S., Saginaw.

10:00 A. M.

"Bleaching Discolored Tooth Structures; Method and Agents Employed." By H. T. HARVEY, D. D. S., Battle Creek.
Discussion opened by W. A. Dorland, D. D. S., Grand Rapids.

11:00 A. M.

"Then and Now." J. A. ROBINSON, Grand Rapids.
Discussion General.

1:30 P. M.—CLINICS.

"Gold and Platinum Fillings."
By F. W. TEMPLE, D. D. S., Grand Rapids.

"Continuous Gum Work." By L. D. WOOD, D. D. S., Grand Rapids.

"Obtunding Sensitive Dentine and Treating Putrescent Pulps."
By F. A. KOTTS, D. D. S., Toledo, Ohio.

"Filling as it Was Done Fifty Years Ago."
By Dr. I. DOUGLASS, Romeo.

"Dental Cataphoresis," by R. W. MORSE, D. D. S., Lansing.

"The Condit System," by BURT ABEL, D. D. S., Albion.

7:00 P. M.—BANQUET.—At the Lakeside Club.

J. WARD HOUSE, President.
B. H. LEE, Secretary.

A MEETING of the Inter-State Dental Association was held at Excelsior Springs, Missouri, June 23, 24, 25 and 26.

The 18th Annual Meeting of the Indiana State Dental Association was held at Indianapolis in the new Indiana Dental College Building, on June 30th.

### THE NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

THE twelfth annual session will be held at Saratoga Springs, N. Y., commencing 10 o'clock, A. M., Monday, August 2d, and continue in session during the proceedings of the American Dental Association.

It is earnestly requested that all State and Territorial Boards of Dental Examiners will send delegates.

CHAS. A. MEEKER, Sec'y and Treas.,
29 Fulton Street, Newark, N. J.

## DENTAL COLLEGE FEES.

There is a movement on foot among dental colleges to force the annual fees paid by students up to a mimimum of $100. The movement began among private institutions. The University of Michigan charges $45 a year.

It is expected that all institutions that do not conform to the new rule will be excluded from the national association of dental college faculties, and that the national board of examiners and many state boards will discriminate against institutions not represented in the national association.

So far as this state is concerned, the board of examiners are governed by a statutory provision which makes the dental college requirements of the university their standard for admitting applicants to practice.

A moderate raise, however, is regarded as almost of necessity. Some people here desire to make all professional departments entirely self-supporting, a distinction at present enjoyed solely by the law school. The weight of opinion, however, favors low fees, and in keeping this institution in all departments, "a poor man's university."

Dean J. Taft and Secretary N. S. Hoff will represent this dental college in the national convention of the dental faculties. It is stated that the regents have directed them to use their influence against the proposed change.

## NOTICES.

Copies of certain numbers of the Journal are wanted by the library. Anyone having copies of the following numbers will confer a great favor, and will be well paid, if they will forward them: Vol. I, No. II; Vol. II, No. I; Vol. II, No. IV; Vol. III, No. I; Vol. III, No. IV; Vol. IV, No. I; Vol. IV, No. IV. Please address,

Dr. A. W. Haidle,
Ann Arbor, Michigan.

Dentists having extracted teeth on hand will be doing the college a great service if they will forward them C. O. D. to Dr. L. P. Hall, Ann Arbor, Michigan.

## ALUMNI NOTES.

Dr. F. F. Scott, '95, expects to locate this fall in Washington, D. C.

On June 1, Dr. A. Ball, '95, of Flushing, Michigan, was seen about the college.

Dr. Frank D. Wilson, '81, of Omaha, Nebraska, has removed to Atlanta, Georgia.

Dr. A. H. Kessler, '94, spent Commencement week in Ann Arbor and Ypsilanti.

Dr. C. T. Whinery, '94, of Toledo, called on friends and visited about the college on May 13.

Dr. R. E. Drake, '88, of Negaunee, Michigan, spent Commencement week in this city with friends.

Dr. Douglas Anderson, '95, has associated himself in practice with his brother Albert E., at Maidstone, England.

Dr. F. W. Blake, '94, of Alpena, visited the college May 12 and 13. Dr. Blake is associated in his practice with Dr. F. A. Carr.

Dr. M. J. Moyer, '94, of Dundee, Michigan, has sold his practice to Eddie W. Brown, '96, and intends to locate in the west.

A nine-pound boy was born to Doctor and Mrs. G. E. Tribby, '92, of Mentor, Ohio, on May 13. Congratulations are in order.

Dr. W. G. Lentz, '95, of Mentor, Minnesota, has removed to Prescott, Arizona. Charley Cleaver, '96, will take Dr. Lentz' practice in charge.

The news comes to us that Dr. J. H. Stromier, '95, of Glasgow, Scotland, has successfully passed his examinations in that country for the L. D. S. degree.

We learn that Dr. Harry B. Respinger, '95, of Basel, Switzerland, has established a polyclinic. Poor patients are seen free of charge each morning from eight to nine o'clock, Sundays excepted. This action of Dr. Respinger is certainly commendable.

A recent letter from Dr. F. E. Dodge, '95, of Vienna, Austria, affirms that that city is one of the finest in the world, not only as a residence, but as one in which to practice dentistry.

At the last meeting of the Detroit Dental Society, the following officers were elected for the ensuing year: Drs. J. L. Young, president; W. C. Herbert, '89, vice-president; J. M. Thompson, secretary; and Will Cleland, '84, treasurer.

At the regular meeting of the Alumni Association held on June 24, the following officers were chosen: Dr. L. P. Hall, president; Dr. Ostrander-Adams, Toledo, vice-president and Dr. A. W. Haidle, secretary and treasurer. The members of the class of '96 were elected to membership upon signing the constitution and upon payment of the membership fee of fifty cents.

Among the loyal alumni who returned to attend the meeting of the Alumni Association and the Commencement Exercises, were Mrs. Dr. Ostrander-Adams, of Toledo, Ohio, and Mrs. Dr. Miller-Gedney, of Winnebago, Minnesota, both of '94. Dr. Miller-Gedney was accompanied by her three-months-old son and will remain in Ann Arbor until September visiting with her mother.

At the meeting of the Michigan State Dental Association the following officers were elected: Dr. A. W. Diack, of Detroit, president; Dr. E. T. Loeffler, of Saginaw, 1st vice-president; Dr. H. T. Harvey, of Battle Creek, 2d vice-president; Dr. H. C. Raymond, of Detroit, secretary; Dr. Geo. H. Mosher, of Jackson, treasurer, and Dr. J. L. Sweetman, of Manistee, member of Board of Control.

## A SUMMER SCHOOL.

At a recent meeting of the Faculty of our department it was decided to establish a Summer School in dentistry in connection with that of the other departments in the University. Being a new departure it may be regarded in the light of an experiment. From present indications it is expected that from eight to twelve students will be enrolled, all of them at present students in the department.

For this year, at least, no instruction will be given but that of a mechanical nature, though it is hoped that if the venture proves successful, the scope of the work may be enlarged upon in the future.

We give, herewith, a schedule of the courses as arranged, with the fees for each: *a*. For full term of six weeks—instruction in any or all desired branches of mechanical technique—matriculation fee, five dollars; tuition fee, twenty-five dollars. *b*. For instruction in continuous gum and other porcelain work matriculation fee, three dollars; tuition fee fifteen dollars. *c*. For instruction in the making of regulating appliances—matriculation tee, three dollars; tuition fee, fifteen dollars. *d*. For instruction in crown and bridge-work, and in plate-work—matriculation fee, three dollars; tuition fee, fifteen dollars.

These courses may be taken in connection with others that are open in the scientific and literary departments of the University. It is hoped that another year may see some of our older alumni and practitioners interested in this undertaking. Dr. A. W. Haidle will give the instruction, though the whole will be under the supervision of Dr. N. S. Hoff. Credit will be given for all work done, and will be recorded on the secretary's books.

## MICHIGAN STATE BOARD OF DENTAL EXAMINERS.

At the last meeting of the State Board of Dental Examiners, held in Saginaw, on May 5, 6, 7, 8, sixteen applicants presented themselves for examination, of which number the following passed:

| NAME. | COLLEGE. | RESIDENCE. |
|---|---|---|
| C. L. Norton, | No college, | Adrian. |
| N. G. Bowbeer, | Univ. of Maryland, | Wyandotte. |
| A. S. Atkinson, | Penn. Dental College, | Detroit. |
| T. C. Lunger, | Penn. Dental College, | Detroit. |
| D. E. Parmelee, | No college, | Lansing. |
| L. D. Mills, | No college, | Coopersville. |
| J. S. Watts, | No college, | Brown City. |
| H. Darling, | Chicago Coll. Dent. Surg., | Sault Ste. Marie. |
| F. H. Walters, | Indiana Dental College, | Maple Rapids. |
| W. F. Alton, | No college, | Bay City. |
| G. H. Sweet, | Phila. Dental College, | Detroit. |

The next meeting of the Board will be held in Detroit, October 20, at 10 o'clock A. M.

FRANK O. GILBERT, D. D. S., Sec.,
Bay City, Michigan.

## REPORT OF PROSTHETIC CLINIC FOR 1895–6.

| | |
|---|---|
| Full upper rubber plates | 16 |
| Full lower rubber plates | 7 |
| Partial rubber plates | 16 |
| Repair rubber plates | 17 |
| Regulating cases | 5 |
| Bridges | 4 |
| Bridges, repair | 1 |
| Porcelain crowns | 3 |
| Gold crowns | 41 |
| Richmond crowns | 1 |
| Logan crowns | 1 |
| Aluminum plates | 11 |
| Watt's metal plates | 15 |
| Watt's metal plates, reset | 1 |
| Watt's metal plates, repair | 1 |
| Silver plates | 14 |
| Silver plates, repair | 2 |
| Total number | 156 |

## OPERATIVE CLINIC FOR 1895–6.

| | |
|---|---|
| Bridges | 2 |
| Bridges, repair | 4 |
| Caps, gold | 2 |
| Crowns, gold | 31 |
| Crowns, porcelain | 2 |
| Crowns, Logan | 82 |
| Crowns, Logan, banded | 3 |
| Fillings, gold | 6185 |
| Fillings, plastic | 1280 |
| Treatments | 1255 |
| Extractions | 468 |
| Cleanings | 654 |
| Number patients | 8620 |
| Number operations | 9968 |

# LIST OF GRADUATES OF THE DENTAL DEPARTMENT OF THE UNIVERSITY OF MICHIGAN FOR THE COLLEGE YEAR '95–'96.

| NAME. | RESIDENCE. |
|---|---|
| Elmer Harry Argetsinger, | *Mapleton, Minn.* |
| Frank Charles Arnold, | *Ann Arbor.* |
| Jay Cyrus Arnold, | *Ann Arbor.* |
| Frank Miller Bacon, | *St. Clair.* |
| Clarence Harvey Bailey, | *Detroit.* |
| John Wesley Bass, | *Sullivan, Ind.* |
| Eddie W. Brown, | *Nashville.* |
| Edward Dancey Brown, | *Brownsville, Ont.* |
| Robert Reynolds Buckthorpe, | *Jacksonville, Ill.* |
| Harry Sizer Buell, | *Menominee.* |
| George Franklin Burke, | *Ann Arbor.* |
| Willis Hezekiah Buttolph, | *Pontiac.* |
| Jessie Estelle Castle, | *Battle Creek.* |
| James Nelson Clarke, | *Flushing.* |
| Charles William Cleaver, | *Ann Arbor.* |
| Jonathan Peter Collett, B. S., *National Normal Univ..* | *Ansonia, O.* |
| Irving William Copeland, | *Paw Paw.* |
| Ernest Frank Day, L. D. S., | *London, England.* |
| George Leonard David, | *Aledo, Ill.* |
| Edwin Victor Deans, | *Ox Bow, N. Y.* |
| Charles Alphonsus Devlin, | *Vallejo, Cal.* |
| Stanford James Farnum, | *Cassopolis.* |
| Stanley Ammon Farnum, | *Cassopolis.* |
| Charles Frederick Fitch, | *Jamestown, N. Y.* |
| Fred Anson Graham, | *Ann Arbor.* |
| Fred Joseph Hale, | *Ypsilanti.* |
| Hector Hillman, | *Ann Arbor.* |
| Cleveland Artley Houghton, | *Theresa, N. Y.* |
| Burton Truman Hunt, | *Antwerp, N. Y.* |
| Charles Lee Kemery, | *Flint.* |
| Vernor Jay Lathrop, | *Morgan.* |
| John Adolph Lentz, LL. B., | *Ann Arbor.* |
| Howard Joseph Livingston, | *Denver, Col.* |
| Frank Erland Logan, | *Pickering, Ont.* |
| James White Lyons, | *Mt. Pleasant.* |
| Thomas Steven Mann, | *Ann Arbor.* |
| Samuel Stephen Mummery, | *Ann Arbor.* |
| James Henry O'Toole, | *Ann Arbor.* |
| Charles Augustus Phillips, | *Terre Haute, Ind.* |
| Ross Porter, | *West Sunbury, Pa.* |
| Frank Glenn Powers, | *Scotts.* |

| | |
|---|---|
| Herman Prinz, | *Toledo, O.* |
| Charles Alfred Quackenbush, | *Ludington.* |
| James Robins, | *Warminster, Ont.* |
| William Howard Roper, | *Reedsburg, Wis.* |
| Thomas Francis Sheridan, | *Flushing.* |
| Charles Levant Sherwood, | *Titusville, Pa.* |
| Charles Eyster Slagle, | *Oregon, Ill.* |
| Albert Lyman Smith, | *Orange.* |
| William Joseph Stapish, | *Chelsea.* |
| Morley Punchun Templar, | *Woodstock, Ont.* |
| Wilber Townsend, | *Albia, Ia.* |
| Alburtus Van Ark, | *Holland.* |
| Charles Alfred Wehe, | *Topeka, Kan.* |
| Ralph Levant Williams, | *East Randolph, N. Y.* |
| Raymond Lester Williams, | *Beaver Dam, Wis.* |
| Raymond Parker Winning, | *Saginaw, East Side.* |
| Robert Millard Woodin, | *Ann Arbor.* |
| George Herbert Wooton, | *Hastings.* |
| John Alexander Wooton, | *Hastings.* |
| Percy Bennett Wright, | *Jackson.* |

## DEPARTMENT NOTFS.

H. D. Watson, '97, will spend the summer with Dr. J. W. House at Grand Rapids.

G. W. Randall, '97, will assist Doctor Randall of Port Huron during the summer.

It is understood that several members of '97 will enter Chicago colleges next year.

E. J. Beistle, '97, will pass the vacation months in the office of Dr. Strytser at Buchanan, Michigan.

E. J. Anderson, '98, will be in Ann Arbor during the summer.

W. H. Johnson, '97, will be in Alliance, Ohio, during the vacation.

Miss June A. Burr, '97, will spend the summer at her home in Bangor, Maine.

F. W. Joslin, '97, expects to go on a yachting excursion during the hot months.

A. H. Kinmond, '98, will probably play ball with the Battle Creek team this summer.

It seems that J. N. Vodrey, '97, will spend his entire summer vacation at Deerfield, Michigan.

Miss Dessie B. Robertson, '97, will spend the vacation at her old home, McConnelsville, Ohio.

At the last meeting of the Board of Regents the salary of Dr. A. W. Haidle was raised to $700.00.

L. R. Slawson, '97, will work in the office of his brother, E. D. Slawson, '92, at Bay City during the vacation.

It is rumored that a number of the members of '97 and '98 will be asked by the Faculty to not return next year.

Professors J. Taft, N. S. Hoff and L. P. Hall attended the meeting of the Michigan State Dental Association at Grand Rapids on June 10, 11 and 12.

Geo. F. Burke, '96, will spend the summer months in England, which country he expects to tour on a bicycle. On his return he will locate in Detroit.

F. E. Logan, '96, was appointed by the Board of Regents to the position of Assistant to the professor of Operative Dentistry. It is as yet doubtful if Mr. Logan will accept the position.

It is said that Miss Bertha Woodin and Miss Edith Phillips, '98, will not return to finish the course. It is understood that they do not like dentistry as well as they fancied they would.

Dr. L. E. Custer, of Dayton, Ohio, gave a most interesting clinic and demonstration of his electrical appliance for cataphoresis before the senior class on June 12. Ralph L. Williams, '96, was the patient operated upon and a mesial cavity in the second right upper bi-cuspid was excavated with absolute absence of pain. The current was allowed to pass through the tooth for twelve minutes, and it took less than one minute to turn off all the current. Several classmates added their testimony to that of Mr. Williams, that his teeth were, under ordinary conditions, hypersensitive, yet he experienced no pain whatever during the operation. Dr. Custer certainly has the best appliance of the kind yet seen. A mercury bath increases or decreases the strength of the current as it is allowed to flow in or out of a glass cylinder in which a coil of wire is obliquely suspended. The whole device is as simple as it is perfect and reflects much credit on its already renowned inventor.

J. C. Blair, E. E. Bubb, F. R. Fletcher, G. S. Hadley, all of '97, and A. Bröcking, A. Fellner, C. Lebert, J. B. Stewart, of '98 and R. M. Woodin, '96, will take up special lines of work in the Summer School.

If reports prove true, several members of '97 and '98 will have to enter as '98 and '99 students, respectively, if they wish to return in October. This is because of the poor character of the work done during the year just closed.

On August 5, J. C. Blair, '97, will leave with his father for an extended western trip, after having completed a course of study in the Summer School. Denver, Colorado Springs and Salt Lake City will be the objective points.

A. J. Reed, W. R. Purmort and S. W. Hussey, all of '97, will spend the summer at the Les Cheneaux Club, near Mackinac, where they hold responsible positions, Mr. Reed being clerk of the house. We shall be apt to hear of some monster catches of fish when they return in October.

So far as known the members of the class of '96 will locate as follows:

F. F. Sheridan, Duluth, Minnesota.
C. L. Sherwood, Titusville, Pennsylvania.
C. F. Fitch, Jamestown, N. Y. in partnership with Dr. West.
C. H. Bailey, 986 14th Ave., Detroit.
W. J. Stapish, Ridgeville, Indiana.
I. W. Copeland, Ashland, Ohio.
E. D. Brown, Dundee, Michigan.
G. H. Wooton, Oberlin, Ohio.
P. B. Wright, Cottage Grove Ave. and 47th St., Chicago.
R. R. Buckthorpe, Jacksonville, Illinois.
C. A. Devlin, Vallejo, California.
C. A. Phillips, Terre Haute, Indiana.
W. Townsend, El Paso, Texas.
W. H. Buttolph, Canton, Ohio.
G. F. Burke, Detroit.
F. C. Arnold, Charlotte, Michigan.
H. Prinz, St. Louis, Missouri.
S. A. and S. J. Farnum, Cassopolis, Michigan.
E. V. Deans, Potsdam, New York.
C. A. Wehe, Topeka, Kansas.

T. S. Mann, St. Johns, Michigan.
C. L. Kemery, Pittsburgh, Pennsylvania.
H. J. Livingston, Denver, Colorado.
F. J. Hale, Hudson, Michigan.
B. T. Hunt, Lowville, New York.
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